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THE LOCAL SPECIFIC THERAPY OF INFECTIONS *

I. THE BIOLOGIC BASIS

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Infection is a contest between two opposing forces: one the invading parasite, the other the resisting host. It is a struggle between two contestants, each displaying great resourcefulness and consummate skill. I propose to lay before you the main facts of this combat in so far as they have been worked out and to draw from them a deduction looking to the better control by improved therapeutic methods of the issue of infection.[1]

The properties of living things are not fixed, but are subject to certain and sometimes fundamental fluctuations. What are described as biologic variations arise among the very lowly bacteria and protozoa as among the higher types of plant and animal life.[2] The character of the variations differs merely because of the minute size and the simplicity of structure of the micro-organisms, while the variations themselves are for the same reasons made more difficult to detect. But they can, nevertheless, be followed accurately both in their cultural qualities and immunity reactions; and it has been found that these variations play a significant part in respect to the specific treatment of disease.[3]

The microbic causes of disease are subject to a wide play of essential properties, in part spontaneously, as we say, and in part in response to certain definite experimental conditions. The resultants of the changed conditions are new varieties or forms that retain the new characters for indefinite generations and suffice often to constitute new species.

Thus bacteriologists who have occupied themselves with the study of the group of dysentery bacilli or the wider class of colon and typhoid bacilli now find support for the conviction long held that within these groups genetic relationship among the members exists; and while no one has actually as yet succeeded in converting the dysentery bacillus F into the bacillus Y, and while it may still be doubted, notwithstanding the statements to the contrary, that a typhoid bacillus has been experimentally converted into a paratyphoid bacillus, yet it is nevertheless true that certain colon bacilli regularly undergo changes and develop new special properties quite as fundamental as those that distinguish from each other the types of dysentery bacilli and the typhoid and paratyphoid bacteria.[2]

Moreover, many bacteria are sensitive to chemical poisons to which they may, however, be adapted; and the new strains produced often retain the power to grow in the presence of the poisons even after long being separated from them.[4] When it is recalled that the bacteria often pass through many generations within twenty-four hours it will be seen that this quality of chemical resistance is transmissible to an indefinite series of offspring. It also happens that chemical resistance produced to one poison, such as arsenic, may lead to the simultaneous development of resistance to another, such as antimony; and it has further been ascertained that this power of chemical resistance in artificial cultivations may be retained even when the altered bacteria are returned to the animal body.[5]

The bacteria and protozoa show even more fundamental variations in relation to immunity reactions. Inagglutinable strains of bacteria have long been known as occurring in nature, and similar strains have been produced from previously agglutinable ones by artificial methods of cultivation. In nature, moreover, certain micro-organisms, among which may be mentioned the pneumococcus, streptococcus and the trypanosome of sleeping-sickness, exhibit variations of chemical and immunity reactions that serve to separate them into definite classes or types which, as will be shown, play a highly important part in respect to the specific therapeutics of the infections they cause.[6]

We have now seen that variations in properties among micro-organisms may be native or they may be developed by artificial conditions of growth. It remains to add that new varieties also arise among parasitic microbes developing within the body of infected animals. Thus, such micro-organisms as the malarial parasite, the trypanosome of sleeping-sickness and the spirochete of relapsing fever or syphilis, may, as a result either of the processes of spontaneous recovery, or of induced healing by chemical drug or specific serum, suddenly acquire a state of resistance to the curative principles and become no longer subject to their influence. This state of resistance

* This is the first of two lectures which as here presented are based on the Harben lectures of 1912 given before the Royal Institute of Public Health, London, and the Trimble Lectures of the Medico-Chirurgical Faculty of Baltimore of 1913.

1. Flexner: Arch. Pediat., 1908, xxv, 780; The Biologic Basis of Specific Therapy, Boston Med. and Surg. Jour., 1911, clxv, 709; The Local Specific Treatment of Infections, Harben Lectures, Jour. State Med., London, 1912, xx, 130, 193, 257.

2. Müller: Bakterienmutationen, Ztschr. f. Induk. Abstamm. u. Vererbungs., 1912, viii, 305.

3. Neufeld and Händel: Ueber Herstellung und Prüfung von Antipneumokokkenserum und über die Aussichten einer spezifischen Behandlung der Pneumonie, Ztschr. f. Immunitätsforsch., Orig., 1909, iii, 159. Ehrlich: Ueber Chemotherapie, Centralbl. f. Bakteriol., Abt 1, Referate, 1911, l, Supplement, p. 94.

4. Marks: Ueber einen arsenfesten Bakterienstamm, Ztschr. f. Immunitätsforsch., Orig., 1910, vi, 293.

5. Seiffert: Studien zur Biologie der Darmbakterien, Deutsch. med. Wchnschr., 1911, i, 1064.

6. Neufeld and Händel: Ueber Vorkommen und Bedeutung atypischer Varietäten des Pneumokokkus, Arb. a. d. k. Gesndhtsamte, 1910, xxxiv, 293. Ehrlich: See Footnote 3. Lamar: Chemo-Immunologic Studies on Localized Infections, Jour. Exper. Med., 1912, xvi, 581. Spiess: Die Anwendung von Antistreptokokkenserum (Höchst), per Os und lokal in Pulverform, Deutsch. med Wchnschr., 1912, xxxviii, 207.

has come to be spoken of as "fastness," and its recognition has thrown a new and penetrating light on the troublesome and often very serious relapses that appear in the course of infectious diseases.[7]

In the healing of infectious diseases by Nature, as we are wont to say, we now recognize that the microbic causes are gradually or even suddenly suppressed through the development by the body of immunity principles capable of bringing about their destruction through dissolution or phagocytosis. When healing is promoted by remedies such as the specific serums, the immunity reaction of the infected body is merely anticipated by the artificial injection of the serum. When, on the other hand, curative drugs are employed, the action is somewhat more complex. Under these circumstances the suppression of the microbic causes of the disease is accomplished partly by the action of the drug and partly through the immunity principles developed from the parasites brought to destruction by the drug.[7]

This interaction of chemical substance and specific antibody, through which the parasites are brought to destruction, is a desirable process, since it insures not only prompt recovery from infection but also security against reinfection. Experience has abundantly shown that Nature's mode of cure of many of the infections is perhaps slow, but, none the less, possesses the great merit of affording an enduring protection against another attack of the same malady. This is the reward of a gradual process of immunization that leaves the restored body amply armed with actually or potentially ready immunity principles that suffice to ward off impending infection.[8] When recovery is assisted by the employment of artificial immune serums the body, probably, is left in much the same state of preparation, while the effect of healing drugs is determined by the precise nature of their influence on the microbic causes of disease and varies according as the resulting dissolution products are not altered chemically beyond the point at which antibody formation is still possible.

Under the older conditions of the treatment of syphilis with mercury, instances of reinfection were rare and commonly disputed. Under the new conditions of treatment with the far more vigorous salvarsan, reinfection indisputably occurs. This disparity is undoubtedly to be attributed to the different responses by antibody formation to the destroyed spirochetes under the two modes of chemical action[9]; and while at first glance the older method appears to possess advantages over the newer, there are, as a matter of fact, offsetting conditions that quite change the situation.

Not a few infections, and those particularly that pursue a chronic course, are characterized by a tendency to recrudescence or relapse in process of recovery. This condition is commonly observed in malaria, spirochetal infections, trypanosomiasis and tuberculosis. It also appears with less regularity among many other infections. Excluding tuberculosis from present attention because of the lack of knowledge of transformation in type of tubercle bacilli within the body, we may consider what happens when relapses take place in the remaining infections. It is common knowledge that in the course of treatment of malaria with quinin a state of excessive resistance of the parasite to the drug sometimes arises. In the treatment of trypanosomal and spirochetal infections similar resistances are encountered. Indeed, so commonly has this phenomenon been observed, in the course both of spontaneous or natural infections, so-called, of man and animals and in the experimental ones as well, that the corresponding relapses are now recognized as a characteristic of the clinical characters of the diseases concerned.

Painstaking study has yielded an explanation of the cause of the resistance among the parasites on which the relapses depend. The resistant parasites are variants of the normal species produced artificially in the course of treatment by antibody or by drugs. The variations induced may persist indefinitely and be transmissible. According as the parasite affected is capable of appearing in few or many relapse forms, so-called, the corresponding diseases are attended by few paroxysms, as in relapsing fever, or many, as in malaria or syphilis. Ultimately the complete suppression of the infecting cause is due, when it is accomplished, to the development within the host of as many kinds of antibodies as relapse types of the parasite occur.

Hence in considering the problem of the therapeutics of infection we must take into account the fact that the parasites possess an advantage of regulation within themselves to preserve them from extinction, through which they alter rapidly, not their form and external appearances so much as their chemical characters, when too closely pressed and menaced. And this change consists in the development of a state of resistance or "fastness" to injurious chemical bodies, whether the immunity principles of the blood or still other substances.

It is true that the active termination of infections through the unassisted elaboration of specific protective principles by the infected body probably oftener secures to the host an enduring immunity than does the more quickly induced passive termination through the operation of artificial healing substances; for in the first instance the variety of antibodies evolved may equal all the possible number of normal and fast strains to which a given microbe is subject and thus a more perfect protection be secured. A specific treatment that destroys the parasites, not at one blow, but successively may, however, bring about a similar result, since, although each succeeding group of parasites yields less easily, yet in succumbing it gives rise to a new variety of antibody. Against the advantages of producing by a slow process an enduring immunity or recovery, however, must be weighed the danger of fast strains arising that may prove impossible of destruction with any known means whatever. From the point of view of effective therapeutics it is thus clearly desirable to terminate the infection quickly and diminish the risk involved. To accomplish this result several factors must cooperate: the specific chemical or serum must not only be suitable but also come to act on the parasitic causes of disease in such degree of concentration as to insure the maximum effect. It has been shown for trypanosomal, meningococcal and streptococcal infections that the higher the concentration of the specific immune serums about the corresponding parasites the greater is the assurance of their complete destruction.[10]

7. Ehrlich: Ueber Chemotherapie, Centralbl. f. Bakteriol., Part 1, Referate, 1911, l, Supplement, p. 94. Rosenthal: Experimentelle Untersuchungen über des Wesen und die Genese des Rezidivs Ztschr. f. klin. Med., 1913, lxxvii, 161.

8. Flexner: The Biological Basis of Specific Therapy, Boston Med. and Surg. Jour., 1911, clxv, 709.

9. Schilling, von Krogh, Schrauth and Schoeller: Die Wirkung organischer Quecksilberverbindungen bie Spirochäteninfektionen, Ztschr. f. Chemotherapie, Orig., 1912-13, I, 21. Antoni: Sieben Fälle von Reinfectio syphilitica und Betrachtungen über schwere salvarsan-Intoxikationen, Deutsch. Med. Wchnschr., 1913, xxxix, 508.

10. Ehrlich: See Footnote 7. Flexner: A Serum-Therapy for Experimental Infection with Diplococcus Intracellularis, Jour. Exper. Med., 1907, ix, 168. Flexner and Jobling: An Analysis of Four Hundred Cases of Epidemic Cerebrospinal Meningitis Treated with the Antimeningitis Serum, Jour. Exper. Med., 1908, x, 690. Neufeld and Kandiba: Beitrag zur kenntnis der "antiaggressiven" Sera, Arb. a. d. k. Gsndhtsamte, 1912, xl, 1.

There is still another consideration that merits attention. Hitherto we have employed curative serums or drugs separately, and not in conjunction, to support and supplement each other. Since in the course of their curative action the specific drugs are assisted in the destruction of parasites by antibodies, the artificial combination of specific drug and specific antibody should offer definite therapeutic advantages. One of the advantages to be gained by enlisting more than one antagonistic agent against the pathogenic micro-organisms results from the circumstance that an antibody or drug will operate with greater effect against an already injured than against a normal parasite, and, next, because mutation in several directions is less readily achieved than in the one direction. Hence a fortunate union of serum antibodies and suitable chemical substances affords, in theory at least, a favorable means of suppressing infection. That this is not merely a fancy, but has already been verified by experiment, it will be part of the next lecture to show. But just as the availability of every chemical substance is determined by the manner of its distribution in the body, and that in turn is decided by facts of chemical and physical affinity for particular tissues and cells, so will the utilization of combinations of different therapeutic agents depend on the completeness with which they can be made to act together in the manner designed. This requirement might be met either by happy accident, once the joint bodies are introduced into the blood and allowed of their own affinities to seek together the places at which their action is to be manifested, or by intent, when they are introduced purposely directly into the seats of disease.

Having accomplished so much we must look forward as a next step to the greater perfection of immune serums themselves. By taking into account the natural types or races of pathogenic micro-organisms, each with its definite specificity, and perhaps also the fast strains artificially produced, new and more effective bactericidal serums may be produced. In the past an effort has been made, but imperfectly, to develop polyvalent serums by employing for immunization purposes many different strains of a given micro-organism; but increased knowledge has shown that this method may or may not succeed, according to whether in the choice of cultures racially dissimilar strains have or have not been secured; for an immune serum prepared with one racial strain will be effective against all samples of that strain and wholly ineffective against all members of another strain, and vice versa. The problem, therefore, is first to adapt the serum or chemical to the particular strain of infecting micro-organism and then to insure its maximal effect by direct application to the seat of infection.

It should now be apparent of what high importance in respect to the specific treatment of microbic disease is this phenomenon of variation among micro-organisms, which earlier I compared to mutation among the higher plants and animals. The variations among the bacteria and protozoa occurring in external nature, or produced in test-tubes, or appearing under the influence of drug or antibody acting within the infected animal, arise often with startling rapidity. They are therefore in essence identical with those alterations of character that constitute mutation among the higher living organisms. But there remains, possibly, still another way in which this phenomenon may operate to cause disease. The realm of microbiology includes the subject of epidemiology or the science of the nature of the causes accountable for epidemics of disease. The data of epidemiology, because of their inherent complexity, are still few and uncertain. Now I wish to suggest that those remarkable and often sudden accessions of virulence in micro-organisms that determine devastating epidemics may have their origin in mutational modifications affecting particularly their pathogenic or disease-producing power. We have recently witnessed manifestations of sudden accession of disease-producing power, which have resulted in pandemics of meningitis and poliomyelitis, that within ten years have twice encircled the globe; and, in a somewhat more restricted field, severe outbreaks of milk-borne streptococcus infection prevailing in Baltimore, Boston and Chicago and claiming many victims. Imperfect as our knowledge is of the relation between cultural conditions and the rise of virulence, nevertheless evidence exists tending to show that plague bacilli[11] in artificial culture may suddenly take on a heightened pathogenic power, and streptococci growing in milk as suddenly assume the cultural peculiarities of the special micro-organism responsible for the epidemics of so-called streptococcal septic sore throat.[12]

Turning now to another aspect of our theme, namely that of local therapy, it should first be stated that the idea of specific treatment of disease is not a new invention, although the significance of the term to-day is wholly different from that previously current. The discovery of specific drugs for combating disease is not a new achievement. Cinchona bark and its alkaloidal constituents and the compounds of mercury are as specific therapeutic agents as the latest product of the biochemical laboratory. But the manner of attacking the problem of the cure of disease is wholly different to-day from what it was in the past. The place of chance and empiricism which ruled the earlier quest has been taken by knowledge, in many ways and cases accurate and full, concerning the nature of the causes of the infectious diseases and the means of their suppression. It is, indeed, to the acquisition of this fund of knowledge that we owe the more rapid advances being made and the hopefulness with which the immediate future of discovery in the domain of specific therapy is being viewed. Having now considered some of the shifts adopted by the parasites to accomplish the ends of infection we may turn with profit to an examination of the means employed by the animal body in resisting their effects.

Immunology and experimental therapeutics have established the chief factors on which recovery from infection rests. All are in last analysis chemical reactions that are performed with varying reagents consisting of antibodies, phagocytes and specific drugs, acting separately or together. Probably the antibodies and phagocytes always cooperate and in many instances certainly, if not in all, the antibodies, phagocytes and drugs as well. Recovery from infection, therefore, is brought about through suppression of the microbic causes either by biologic antibodies evoked within or by drugs introduced from without the body. The antibodies, it is well known, consist of several sets of definite substances named cytolysins, agglutinins, precipitins, opsonins, etc., beside which are to be placed the essential leukocytes or phagocytes whose part in the drama is not less conspicuous. You are aware, moreover, that at best the antibodies are but slightly represented in the healthy body and are produced anew either wholly or largely in the infected one; while the quality of the phagocytes is not noticeably

11. Gotschlich: Allgemeine Morphologie und Biologie der pathogenen Mikroorganismen, in Kolle-Wassermann: Handbuch der pathogenen Mikroorganismen, 1911, i, 167.

12. Davis: Bacteriologic Study of Streptococci in Milk in Relation to Epidemic Sore Throat, THE JOURNAL A. M. A., June 15, 1912, p. 1852.

altered, although their number is often increased and their activities are frequently excited through new antibodies, such as opsonins, which are elaborated.

The antibodies, or immunity principles, as they are also called, are detected in the blood, although produced in the bone-marrow, spleen and lymphatic tissues generally. The quantity existing in the blood is taken as a measure of their potency, although in a few known instances efficient immunities exist without the presence of demonstrable corresponding antibodies in the blood. The immunity principles, however, and the phagocytes that act along with them in defense of the integrity of the organism, pass from their sources of production in the organs into the blood, from which they endeavor to reach the special locations of the infective microbes which they are designed to overcome.

In identical manner the curative serums prepared artificially in animals and the specially fashioned specific drugs that are introduced into the body from without are so placed as to reach as directly as possible the circulating blood, which is to become the purveying medium to the rest of the body. We are obliged, therefore, to take account not only of the nature but also of the manner of distribution of parasitic micro-organisms within the infected body, either as they occupy the blood, when they can obviously be brought immediately under the influence of the curative agents, or as they are confined in the tissues or segregated in a remote cavity where they cannot be reached so directly. In the latter instances they can at best come under the influence of the lymph that in process of being separated from the plasma of the blood carries away from the latter part of its various dissolved ingredients.

It is the lymph which contains the protective, as it does the nutritive, principles for tissues and organs, and hence this fluid provides the essential safeguard against infection. The protective principles are not known in the pure state, but there are excellent reasons for regarding them as protein in nature and as composed of compounds of high molecular size. Hence they partake of the physicochemical and osmotic limitations of this class of compounds.

Their relation to the lymphatic fluids is of high importance as affecting the problem of infection. We know that the perfected antibodies do not persist indefinitely within the blood. When they are introduced passively by injection the quantity begins to diminish until at the expiration of a few weeks or months, and more quickly in the case of injected foreign (heterologous) than of native (homologous) serum, they have wholly disappeared. The manner of their disappearance is still undetermined, but little appears to be excreted unchanged, while the greater quantity would appear to be metabolically transformed. On the whole, assuming the principles to be protein matter, it is remarkable that they should resist the metabolic processes so well. Their capacity to pass into the lymph is of even greater significance. Since they partake of the nature of the proteins, we should expect them to be similarly affected by the varying compositions of the lymph in different regions of the body. It is common knowledge that the quality of the lymph in the serous cavities and in the cellular tissues is not equal. While the lymph taken from a large lymph-vessel or cavity of the spermatic cord may approach in protein content that of the blood, the lymph yielded by the serous cavities is more dilute than blood-serum, and, moreover, the fluids of the several cavities vary among themselves within wide limits. In one individual and under identical conditions of production a lymphatic transudate in the pleura may show in a thousand parts twenty of protein, in the peritoneum eleven, and the cerebrospinal membranes six. Whatever the anatomic conditions are on which this difference depends, its physiologic significance is at once apparent. We have only to discover that relationship exists between the protein and the antibody content of the several fluids to arrive at the important deduction that the chemical composition of the lymph is a deciding factor in the issue of infection.

Our knowledge of the quantity of immunity principles present in the lymphatic fluids as compared with the blood of the same individual is still imperfect, and yet its meaning is unmistakable. We can take as indexes of the general content in protective principles the amounts of agglutinin and hemolysin that have been shown to occur in different transudates. Under conditions in which the agglutinin for the typhoid bacillus exists in the blood it has been found absent from the lymphatic fluids in the peritoneum, pleura and pericardium.[13] Hemolysin, antihemolysin and complement have all likewise been ascertained to be absent altogether or to be present in diminished and fluctuating amounts in the several transudates and exudates occurring in these cavities; and it is highly exceptional for any at all to exist in the cerebrospinal liquid.[14] Furthermore, a relation has been established between the total nitrogen, as determined by the Kjeldahl method, and the quantity of immune bodies present in the fluids, a circumstance that in itself shows how intimately these substances are bound to the protein moiety of the lymph.[15]

It is known that the substances which cause agglutination offer a certain resistance to diffusion *in vitro;* and in the living organism it is certain that the phenomena surrounding diffusion are far more complex than in dead membranes, and the passage of different dissolved elements of the plasma into the humors and secretions is not explained solely by simple dialysis. The very fragile barrier of the placenta is sufficient to arrest the passage of agglutinin from the mother into the fetus. The mechanism that provides for the secretion of the tears, saliva and urine permits little or no agglutinin to pass; while that which brings about the secretion of milk secures at the same time the passage of immunity principles of varied sorts and in quantities that approach or even equal the amounts existing in the blood.[13]

As it is the protein, and in particular the globulin fraction of the lymph which carries the immunity principles, it follows that the several lymphatic fluids will determine the degree to which the serous membranes and other parts are supplied with them, and that the subarachnoid spaces of the central nervous system will be least well supplied of all. This consideration must be of high importance as affecting the provision for warding off and later controlling and abating an infection. Since the anatomic structure decides the quality of the lymphatic fluid in health it also determines it in disease; and by regulating in the first instance the composition of the fluid and, in the next, the extent of the lymphatic interchange, it commands the issue of the pathologic process.

13. Levy and Gissler: Untersuchungen über Typhusserum, München. med. Wchnschr., 1897, xliv, 1435.

14. Strauss and Wolff: Ueber das hämolytische Verhalten seröser Flüssigkeiten, Fortschr. d. Med., 1902, xx, 1, 209. Lüdke: Ueber Hämolysine und Antihämolysine in menschlichen Transsudaten und Exudaten, Centralbl. f. Bakteriol., Orig., 1907, xliv, 268.

15. Archard and Bensaude: Sur la présence de la propriété agglutinante dans le plasma sanguin et divers liquides de l'organisme, Compt. rend. séances de l'Académie des sc., 1898, cxxiii, 504.

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Under such conditions parasites which have become localized in inaccessible or not readily accessible regions are insured a potential advantage against the host; and this advantage is strengthened by the circumstance that, as they multiply within a confined area to which the lymph has not ready access, they exhaust the immunity principles originally present. Hence the sufficiency of the immunity principles is determined not only by intrinsic qualities of parasite and host, but also, in high degree, by the manner of location and distribution of the parasites themselves within the infected host. Whether the parasites have a general distribution throughout the blood and tissues, or are confined within a pathologic process in the interior of an important organ, may be the factor deciding not only whether the native curative principles shall gain ready access to them, but also whether or not extraneous curative substances introduced from without into the body shall be able to reach the seat of disease.

In the course of the struggle for survival, therefore, the parasites withdraw at times into situations which are reached imperfectly and with difficulty by the lymph, and thus they produce local inflammations more or less cut off from the general circulation and the curative agents purveyed by the blood. This is the condition encountered in massive inflammations, in abscess formation and in infections of the serous cavities receiving a modified and diluted lymph secretion.

Manifestly, therefore, the bringing of the causes of microbic diseases under the influence of healing substances will be more readily and certainly accomplished when the parasites are widely disseminated throughout the body than when they are hidden away within an organ or in the interior of a cavity. Hitherto the most effective specific curative agents have been just those that operate against the generalized infections, of which quinin in its action against the malarial parasite affords an example; while the control of diphtheria by antitoxin, perhaps the most perfect example of all, consists essentially of the neutralization of a universally distributed poisonous or toxic substance that is directly the source of the serious effects of the disease. When in generalized infections the surviving micro-organisms escape from the blood to aggregate in special situations and local pathologic products that are not readily reached by the lymph, then the specific drug or serum asserts its curative power with far more difficulty and far less certainty.

Special aggregations of this kind, more or less inaccessible to the circulating healing principles, are gummatous formations and the still other special localizations of the syphilitic virus that occur in locomotor ataxia and possibly in paresis, the trypanosomal cause of sleeping-sickness when confined in the central nervous system, the pyogenic bacteria contained within large collections of pus-cells, tubercle bacilli enclosed in caseous foci, and many other instances that suggest themselves. When obliterating disease of the arterial system exists, as in certain tuberculous, syphilitic and other focalized lesions, the ability of the healing principles to penetrate into the pathologic lesion is still further diminished.

No part of the body is, as has been seen, so isolated anatomically and physiologically from the contents of the blood as are the subarachnoid spaces of the central nervous system, in consequence of which pathologic states affecting the meninges and the adjacent central nervous tissues that depend on the fluid contents of these membranes for food and protection are especially difficult to bring under the influence of curative substances. It has been found far easier, for example, to abolish by specific drugs the trypanosomal cause of sleeping-sickness in the blood and lymph-nodes than in the cerebrospinal liquid. And we are just learning that in tabes, and shall probably learn that in paresis also, it is the special localization of *Spirochaeta pallida* in the central nervous tissues in situations accessible to the craniospinal fluid, rather than to the blood, that has so largely determined the failure of almost every effort to combat these now established syphilitic affections by the usual antisyphilitic remedies.[16]

Without entering into discussion of the question in how far the cerebrospinal fluid constitutes the lymph of the central nervous system, we may yet consider with Mott[17] that it completely occupies the subarachnoid spaces and communicates with a canalicular system surrounding the vessels and nerve-cells of the brain and spinal cord. This liquid should therefore provide the most direct path for the penetration of active substances to the nervous tissues. Pharmacologic tests have demonstrated the existence of such a system of communication. Thus, while it has been abundantly shown by experiment that many active substances present in the blood are successfully excluded from the craniospinal fluid, it has also been found that when they are introduced into it directly the effects produced on the nervous organs are particularly severe. Many examples might be given in illustration, but only one will be cited.

Behring found the hen not subject to the effects of tetanus toxin injected into the blood and highly subject to its action when it was injected directly into the subarachnoid spaces. Of the many different drugs tested certain nitrites pass in small amounts the barrier of the chorioid plexus to gain access to the cerebrospinal fluid, while hexamethylenamin (urotropin) alone passes the barrier freely. It appears that after the intravenous, but not after the intramuscular, injection of salvarsan detectable quantities of arsenic appear quickly in this fluid and as quickly disappear.[18] The intact chorioid plexus therefore exercises a high degree of control over the composition of the cerebrospinal fluid. The fluid itself readily escapes into the general blood and apparently by way of direct anatomic communications existing between the subarachnoid spaces and the veins. Evidence is lacking of a similar direct communication with the lymphatic system.[19] From this it follows that while the composition of the cerebrospinal liquid is little subject to influence through the components of the blood, it readily yields to the blood all that it contains. When the meninges and the chorioid plexus are acutely inflamed, the cerebrospinal fluid receives from the blood an increase of protein matter and thus probably any associated immunity principles which the blood contains. It appears, however, that the principles remain in the meninges only a short time and exert little neutralizing effect on poisons or microbes.

It must now be evident that the solution of the problem of specific treatment of disease is bound up in no small way with the problem of the segregation of the parasitic causes of infection in relatively inaccessible portions of the body. Hence, the recommendation which I bring forward is that of a more direct mode of attack

16. Swift and Ellis: The Direct Treatment of Syphilitic Diseases of the Central Nervous System, New York Med. Jour., 1912, xcvi, 53. Wechselmann, Ueber intralumbale Injektion von Neosalvarsan, Deutsch. med. Wchnschr., 1912, xxxviii, 1446.

17. Mott: The Oliver-Sharpey Lectures, On the Cerebrospinal Fluid, Lancet, London, 1910, ii, 79.

18. Sicard and Bloch: Perméabilité meningée à l'paraénobenzol, Compt. rend. Soc. de biol., 1910, lxix, 624.

19. Dixon and Halliburton: The Rapidity of Absorption of Drugs Introduced into the Cerebrospinal Fluid, Proceedings of the Physiological Society, Jour. Physiol., 1912, xliv, p. vii.

on the local processes of infection that are not readily, or at all, to be reached by the introduction of curative agents into the blood. It is patent that a method enabling the healing substances to be delivered in and about the seat of disease and made to exercise their effects on the parasites, not through a diluted lymph secretion, but in such a state of concentration and combination as experiment and experience proves in given instances to be useful, offers high hopes of success. So far as the surfaces of the body are concerned the method of local treatment, generally considered, is time-honored; but even with the infections of these surfaces it has been too little practiced. In the second lecture I shall present evidence bearing on the advantages that may be gained from a wider adoption of the practice of specific local therapy.

I have now briefly and, I fear, inadequately presented the main facts that have to be taken into account in the working out of a system of specific therapy of the infectious diseases. If I have inspired a depressing sense of hopelessness in the quest I have failed in my purpose. It is indeed true that while we have been fascinated with admiration for the wonderful forces possessed by the higher animals for warding off and abating infections, we have perhaps been slow to realize that the parasites themselves must be provided with correspondingly perfected adjustments with which to resist these mechanisms. These adjustments have now been, in part at least, uncovered. The result is that we enter on the task of the perfection of artificial means of strengthening the body's defenses and power of overcoming parasitic microorganisms not with a lessened, but with an increased, feeling of confidence in the issue. To phrase such a problem too simply is to court failure and discouragement; to clothe it in all the facts, without regard to their complexity, is to inspire hope and perchance to win success.

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OVERRESPONSE TO AFFECTIVE STIMULI FROM STATIONARY CORTICAL LESIONS

WITH REPORT OF A CASE*

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An investigation of sensory phenomena resulting from lesions occurring at any level of the nervous system is ordinarily of much interest and is attended with difficulties which in many instances are not easily surmounted. I believe that symptoms resulting from disturbances of the various components of sensation are the hardest symptoms in medicine to interpret, and consequently are the least understood.

After the sensory impulses undergo a regrouping at the first synaptic junction in the spinal cord they ascend in tracts according to quality. All impulses of a painful and thermal character cross over immediately, enter the contralateral spinothalamic tracts, and ascend in secondary fibers of the spinal level.

Those impulses evoking sensations of postural recognition and spatial discrimination ascend in primary fibers of the peripheral level in the ipsolateral dorsal tracts are regrouped in the spinomedullary nuclei, cross over and ascend through the brain-stem in the contralateral mesial fillet.

Impulses evoked by tactile stimuli traverse the cord in the ipsolateral dorsal tracts and the contralateral spinothalamic tracts. It is for this reason that unilateral cord lesions do not cause a loss of tactile sense over any part of the body.

We thus see that the various components of sensation are grouped in the spinal cord and brain-stem and traverse, according to quality, separate paths. On reaching the optic thalamus they are all of whatsoever quality grouped together in the external nucleus. In this organ they undergo a characteristic and definite regrouping. Those which evoke in consciousness sensations of pleasure and discomfort pass by fibers of the thalamic level into the gray matter of the thalamus in the internal nucleus. After acting on the essential center of the thalamus, sensory impulses are conducted by fibers of the cortical level, in five main groups, through the internal capsule and sensory radiation to that portion of the cortex between the precentral convolution and occipital lobe.

Head groups these sensory impulses as follows:

1. Those which underlie postural recognition and the appreciation of passive movement. On this group depends the secondary faculty of judging the differences or identity of two weights placed on the unsupported hands.

2. Impulses which underlie the recognition of tactile differences or the power of appreciating those qualities of touch other than contact and roughness. To this group we owe the faculty of recognizing the increase or diminution in weight of a test object, and of distinguishing the difference between two weights placed on the supported hand.

3. Those on which depend spatial discrimination (compass points applied simultaneously) and its allied faculty, the recognition of size and shape.

4. Those impulses which enable the patient to recognize the spot stimulated (localization). They carry with them the power of appreciating the double nature of two points applied to the surface one after the other.

5. Thermal impulses. On this group depends the possibility of recognizing those degrees of temperature which necessitate a comparison with the consequences of some previous sensation.

We recognize two masses of gray matter or sensory centers in which impulses tend to evoke that psychic state called a sensation. One of these is situated in the internal nucleus of the optic thalamus, the other in the parietal region of the cerebral cortex. Anatomically, the optic thalamus is very complex and plays a threefold part in the fate of all sensory impulses. It contains the termination of all sensory paths. The gray matter forms the center for certain fundamental elements of sensation and is under control of the cortex through the corticothalamic fibers which terminate in the external nucleus, and its activity is checked and regulated by corticothalamic impulses.

Roussy,[1] Holmes and Head,[2] Edinger[3] and various others have correlated the symptomatology with the anatomic findings at necropsy, in lesions of the optic thalamus, and Roussy in 1907 formulated the thalamic syndrome, which is as follows:

1. A persistent loss of superficial sensation of one-half of the body and face. This loss to touch, pain and tem-

* Read in the Section on Pathology and Physiology of the American Medical Association, at the Sixty-Fourth Annual Session held at Minneapolis, June, 1913

1. Roussy, G.: La couche optique, Paris, 1907.
2. Holmes, Gordon, and Head, Henry: A Case of Lesion of the Optic Thalamus with Necropsy, Brain, 1911, xxxiv, 255.
3. Edinger, L.: Giebt es central entstehende Schmerzen? Deutsch. Ztschr. f. Nervenh., 1891, i, 262.

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perature is more or less definite, but the loss of "deep" sensibility is always more pronounced.

2. Slight hemiataxia and a more or less complete astereognosis.

3. Acute pains on same side, persistent, paroxysmal, often intolerable, and yielding to no analgesic treatment.

4. Slight hemiplegia which produces no contracture and rapidly passes away.

5. Choreic and athetotic movements in the limbs of the affected side.

In addition to this symptomatology Head[4] and Holmes have demonstrated a symptom of much interest and value which constantly occurs in those cases in which the lesion disturbs the anatomic integrity of the external nucleus but does not destroy the internal nucleus. This symptom is known as overresponse to affective stimuli. The essential feature of these cases is a greater intensity of feeling tone over the contralateral half of the body to all stimuli which are agreeable or disagreeable in quality. Thus painful prick is more painful over the affected than over the normal side. The same is true of painful pressure. Discomfort caused by heat or cold is also greater over the affected side. This is true even though there be no thermal threshold differences between the two sides. Visceral stimulation produces discomfort in its purest forms, and in these cases the sensation evoked is more disagreeable in character, when the testicle of the affected side is squeezed than when the same amount of pressure is applied to its fellow. If the skin of the sole and palm is scraped with the finger-nail or a rough object is moved over the skin, or the tuning-fork is applied to the affected part, the degree of discomfort is much greater than that resulting from the same stimuli on the normal side. Tickling is normally not unpleasant; but when the tips of the fingers are moved over the palms or soles or cotton wool is rubbed over hair-clad parts on the affected side, the sensation evoked is extremely disagreeable. In these cases sensations of a pleasurable nature, such as pleasurable warmth, are more pleasant on the affected than on the normal side. Head has also demonstrated that the affected half of the body responds more intensely to mental states of pleasure and discomfort; thus, sensations evoked by painful emotion are more disagreeable and those evoked by pleasurable emotions are more pleasant on the affected than on the normal side.

Lesions of the cortex involving the sensory area present a symptomatology essentially different from that of lesions of any other part of the nervous system. The spontaneous sensations are usually paresthesias and defective idea of the limbs of the opposite side. Spontaneous pains may be present in the limbs, but are usually absent. The tactile sense is always disturbed. The response of the affected side to graduated tactile stimuli is essentially variable and inconstant; sensation is never entirely lost to cotton-wool stimulation over hairless or hair-clad parts. With the smallest hair which evokes a constant response on the normal side we can obtain an occasional response on the affected side. Increasing the size of the hairs up to a maximum does not seem to increase the percentage of responses. With the pressure esthesiometer weighted with 2 gm. we obtain a constant response from the normal side but only an occasional response on the affected side. The percentage of responses over the same area of the affected side is not greater when the esthesiometer is weighted up to 40 gm. or more. There is also a tendency to hallucinate because of the continuation of the sensation after the stimulus is withdrawn, and a tendency to quick fatigue over the affected side. In all cases of cortical lesions which cause a disturbance of sensation, the recognition of posture and passive movement are grossly defective. This is due to defective knowledge of position and is greatest at the periphery of the extremities. The power of localizing the part touched or pricked on the affected side may not be impaired, but it is frequently disturbed and may be grossly so. The power of appreciation of two points applied to the skin simultaneously is constantly impaired, and no threshold at all can be established. In some cases the power of appreciating two points applied successively is also impaired. This is true whether the dull or sharp points of the compass be used. The ability to estimate the relative weight of two objects is readily disturbed by cortical lesions, whether the hand be supported or unsupported. Appreciation of size, shape and form may be entirely lost in some cases and retained in others. Appreciation of relative consistence and a recognition of texture are also usually defective. Affective components of sensation which show an overaction in the thalamic lesions are usually not disturbed by pure cortical lesions. Painful prick as measured with the prick algesimeter and pressure pain as measured with the pressure algometer, visceral stimulation, scraping, roughness, vibration and tickling as a rule are neither more nor less pleasant or unpleasant on the affected, than on the normal side. In most cases thermal stimulation shows no threshold differences between the two sides, but there may be an increased neutral zone, a wider range of temperature in which the object feels neither hot nor cold. In other cases, however, an overresponse to affective stimuli may be manifested in cortical lesions. This occurs under two conditions. Monakow applied the term "diaschesis" to the state in which there has been a recent convulsion, an injury, operation or developing tumor of the cortex. In these states there may be an overresponse to affective stimuli, of an irregular and inconstant character. In discussing the optic thalamus, mention was made of the fact that the thalamic center is under control of the cortex through impulses which reach it by way of the corticothalamic fibers. When the external nucleus is disturbed by lesions, cortical control is interrupted and an overresponse of the thalamic center results. This condition has its analogy in the overaction of the lower motor neuron as manifested by increased and abnormal reflexes when cortical control is interrupted as the result of lesions of the upper motor neuron. If cortical lesions be extensive and involve the subcortical structures to such an extent as to interrupt the corticothalamic fibers, the contralateral half of the body shows the same symptoms of overresponse to affective stimuli as when the lesions interrupt these fibers in the external thalamic nucleus. The following case-report is illustrative of a lesion of this character:

History.—G. M., aged 34, a painter, single, entered the Kansas City General Hospital Feb. 15, 1913, complaining of partial paralysis of right side, morphin habit and occasional epileptic seizures. He gave his nativity as Pennsylvania. Family history has no bearing on present trouble. He had had the usual diseases of childhood; variola at 2 years; no other serious illness. He has used alcohol moderately, smokes, drinks coffee to excess and denies venereal history.

Eight years before the patient fell from a scaffold about 12 feet high; in falling he struck his head on the edge of an iron door, fracturing the skull, and was unconscious for

4. Head, Henry: Sensory Disturbances from Cerebral Lesions, Brain, 1911, xxxiv, 171; Sensory Disturbances from Lesions of the Nervous System, Clin. Jour., 1912, xl, 408

eighteen hours; he was operated on immediately, a portion of the skull removed, and a metal plate inserted. Subsequent to the operation he developed a cerebral abscess about six weeks after the injury. The plate was removed, the abscess cavity was drained and a considerable quantity of brain tissue removed with the curet. Following this operation he began having convulsions about eight or nine days apart. He left the hospital at the end of three months, could use his hands reasonably well and continued to follow the occupation of painter. In August, 1911, in an attempt to cure his convulsions, another operation was done and a considerable quantity of skull and brain tissue removed. While he was in the hospital this time morphin was administered to him regularly, and when he left the hospital he was using ¾ grain three times a day. Following this operation he has been unable to use his right hand, his convulsions continue to occur at intervals of about seven days, he has continued to use the morphin and at the time he came under my observation was using 3 grains three times a day.

Examination.—The patient was undersized, of moderate development. On left side of skull there was an area of depression about ¾ inch below the surface, 5½ inches long, and 2 inches wide. The anterior edge was 4 inches posterior to the base of the nose and the upper edge 1 inch from the median line. The fingers of the right hand were contracted and gross tremors and incoordination were manifest on the slightest movement of arm or hand. The movements of the eyes, left side face, left arm and leg were normal. The tongue was projected in the median line but nearer the right than the left labial angle.

The muscles of right face were not so active as the left and emotional expression was absent on the right. The right arm and leg were poorly controlled, incoordinated and spastic. The left hand registered 130 with the dynamometer but the right did not register. The muscles of the right hand and shoulder were slightly wasted from disuse. The convulsions usually involved the right arm and face, beginning in the thumb and then occurring in the face. Occasionally he had a general convulsion and when they became general he lost consciousness; otherwise consciousness was not impaired. The reflexes of the left side were normal in quantity and quality; those of the right arm and leg were considerably exaggerated. Ankle clonus, the Babinski toe phenomenon and various other plantar reflexes were present on the right.

The sensory examination revealed some interesting changes. The patient had a sensation of numbness in the right face, arm, hand, leg and foot. His idea and sense of position of right hand and foot were poor. His responses to light tactile stimulation as applied with cotton wool, the camel's hair brush and von Frey's hairs over right side were quite variable. He responded very intermittently to all these forms of stimulation. When the pressure touch was tested with the pressure esthesiometer, a more inconstant response was manifest. When this instrument was applied with a weight of 2 gm. over the affected areas, sensation was inconstantly evoked. An increase of the pressure by additional weights did not increase the percentage of responses, and no increase was manifested when the instrument was applied with a weight of 43 gm. The patient's sense of localization was tested by the Henri method as modified by Head and Holmes, and also by naming the parts touched, and was found to be greatly impaired over the right side especially the right hand and foot. When the tooth of the Graham-Brown esthesiometer was projected ½ mm. a sensation of roughness was evoked on the two sides.

The patient could distinguish between the relative roughness of 00 and ½ sandpaper equally well on right or left, indicating no threshold differences for this sensation between the two sides; but the sensation was more disagreeable on the right side.

Tickling and scraping evoked a much more disagreeable sensation on the right side than on the left. The vibrations of a tuning-fork were more disagreeable on the right than on the left, but the stimulation was perceived for an average of ten seconds longer on the left than on the right.

The compass sense was good over the entire left side. A threshold could be obtained over the right face but not over either of the extremities. The reaction to measured painful stimuli was normal on the left side, but when the prick algesimeter was applied with a weight of 2 gm. alternately to the two sides, the patient's expression indicated that the stimulus was much more painful on the right than on the left side and he stated that this was the case. There was also a marked lowering of the threshold for deep pain sense over the entire right side. The pressure algometer readings over the corresponding areas of the two sides were as follows, the numbers being given in kilograms of pressure:

Left scapula, 14; right scapula, 4.
Left deltoid, 12; right deltoid, 5.
Left palm, 8; right palm, 4.
Left anterior thigh, 16; right anterior thigh, 9.
Left tibia, 5; right tibia, 2.

The threshold difference for heat and cold varied as between the two sides. There was a considerable increase in the neutral zone on the right, and the sensation evoked by temperatures of a disagreeable character was much more disagreeable on the right than on the left. His sense of position was grossly impaired for the right extremities, and measurement of this defect by Horsley's method as modified by Head and Holmes showed an average variation from the normal of from 4 to 6 inches. The sense of passive movement was also greatly impaired on the right side. On measurement of the defect with the Gordon Holmes apparatus I found it necessary to abduct the right index 20 degrees, adduct it 15 degrees, extend it 6 degrees and flex it 40 degrees before a sensation of movement was perceived. A movement of the left index 2 degrees in any direction was readily perceived. It was necessary to flex the right forearm 20 degrees before the movement was recognized. The appreciation of weight in the right hand was not good, with the hand supported or unsupported. When a weight of 50 gm. was applied to the palm the patient said that he felt that something was touching his palm. It was necessary to increase the weight to 450 gm. before he could appreciate any increase whatever. He could readily differentiate between a weight of 30 and 50 gm. applied to the left hand either supported or unsupported. In the right it was not possible to establish a constant difference threshold, nor was it possible to establish a threshold difference for size. His appreciation of shape, form, consistence and texture was good in the left hand but absent in the right.

As stated before, I have presented this case as one in which the lesion was so extensive in area and penetrated so deeply into the subcortical structures as to interrupt the corticothalamic fibers, and interfere with cortical inhibition of thalamic activity. It may be correctly suggested that perhaps the rather frequent attacks of jacksonian epilepsy and occasional general epileptic attacks produced the unstable nervous state to which Monakow applied the term diaschesis, and that this state was responsible for the overresponse to the various forms of measured stimuli as indicated before. It has been my experience that in states of diaschesis the responses to these forms of stimuli have been variable and inconstant. I had this man under observation and saw him almost daily for a period of two months. I tested his sensation many times, and especially did I test, very frequently, with measured stimuli, the affective components. During many examinations made I found no variability or inconstancy of response, but on the other hand the responses were constant and unvarying in character, and correlating this fact with the extensive area and depth of the lesion, I believe that I am correct in assuming that the overresponse was due to overaction of the essential thalamic center deprived of cortical inhibition.

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CLOUDY SWELLING.

A PRELIMINARY REPORT *

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In 1852 and 1858 cloudy swelling was described by Virchow[1] as a condition in which a parenchymatous organ, such as the liver or the kidney, is swollen, more cloudy and of a more doughy consistency. In advanced stages the organ appears as though it had been boiled. Microscopically these gross changes are accompanied by swelling and increased cloudiness of the cells, the cloudiness being due to an increased number of albuminous granules in the cytoplasm. Virchow believed that cloudy swelling is of frequent occurrence and that it may be widely distributed in the body cells.

Virchow's classical description has persisted in the literature practically unmodified up to the present time. The statement is usually made that cloudy swelling is one of the commonest pathologic conditions encountered at necropsy; but notwithstanding the frequent occurrence of this condition and the apparent simplicity of its characteristics, it is probable that there is a considerable divergence of opinion among pathologists, especially in the identification of the less advanced stages. The reason for this is the absence of definite criteria from which to make judgments. It is difficult to be certain that an organ is swollen unless the swelling is considerable. Measurements of cells may of course be made, but these are open to numerous sources of error, so that only extensive and careful observations are of any value. Again one may find a very cloudy organ, or even one that is both cloudy and swollen, and yet hesitate to name the condition cloudy swelling because the pathologic change seems to be due to fatty metamorphosis or edema and not to an increase of albuminous granules. This uncertainty of diagnosis is not uncommonly felt in the examination of heart muscle. There seems to be no justification in the literature for the diagnosis of cloudy swelling unless the cells are swollen and turbid from an increase of albuminous granules.

In 1852 Virchow stated that the cells swell, become cloudier, less transparent, and more granular. He regarded the newly formed granules as albuminous in nature and apparently not different from those already present in the cell. His description is evidently based on the examination of fresh material.

In 1883, von Recklinghausen,[2] in discussing parenchymatous inflammation, stated that the cells become opaque by the deposition of protoplasmic granules, and that fat droplets then accumulate.

In 1889 Klebs[3] stated that the cells enlarge and assume a finely granular appearance, often plainer on the entire organ than on the individual parts.

In 1882 Cohnheim[4] saw in the cells fine or coarse granules which under normal relations are not present or at least are not so numerous. Cloudy swelling is easier to recognize grossly than microscopically in organs such as the liver, whose cells already contain granules.

Rindfleisch[5] in 1896 described cloudy swelling as a change of the cell protoplasm in consequence of which the cell becomes darker in transmitted light and more opaque in reflected light. It is due to a granular clouding and swelling of the parenchymal cells.

Benario[6] in 1891 emphasized the degenerative features of cloudy swelling. He stated that fat droplets are almost always present.

Thoma[7] in 1896 gave a clear and concise statement of his views illustrated by figures. In the human liver there are no coarse granules other than pigment shown. The cells that show cloudy swelling are larger and much more opaque than the normal and are all crowded with very fine granules in the fresh condition. Fresh normal liver-cells are also finely granular but they are clear, so that the nucleus is not obscured, the granules not being so numerous. In the cloudy swollen cell the nuclei are barely visible because of the large number of fine granules. In the kidney Thoma figures cloudy swollen cells that show the opacity and granulation in fixed and stained specimens. The granules in both liver and kidney cells are extremely small.

Ziegler[8] in 1897 characterized the histologic picture of cloudy swelling as fine granules in swollen cells. He illustrated with a section of kidney treated with ammonium chromate.

Birch-Hirschfeld[9] in 1896 and 1897 stated that the cells are enlarged and that fine weakly refractive granules appear in the protoplasm. In many cases fatty degeneration is associated. An illustration from a frozen section is given.

Ribbert[10] in 1911 described swollen cells with protoplasm more granular than normal, therefore less transparent and cloudier.

Adami[11] in 1908 gave the following description of cloudy swelling: "On examining sections of the tissue, whether freshly cut, or after treatment with the ordinary hardening reagents, the individual cells are no longer so transparent as normal. They have a cloudy, ground-glass appearance, while, in well-developed cases, the nuclei look as though obscured by the deposit of a finely granular material in the surrounding cytoplasm, and stain more feebly than normal."

Von Gierke[12] in 1911 described the cells as finely granular and cloudy.

All of the foregoing observers apparently have studied human tissues. For the most part fresh tissues have evidently been employed; but Ziegler and Thoma describe the granular structure and opacity as still present after certain fixatives. Adami gives the appearance the same in fresh tissues as after treatment with the ordinary hardening reagents. But none of these observers imply that the granules they describe are in any way related to the Altmann granules.

Landsteiner[13] in 1903 studied fixed preparations of normal human organs and of organs exhibiting cloudy swelling. The tissues were fixed in Altmann's fluid.

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1. Virchow, R.: Ueber parenchymatöse Entzündung, Virchows arch. f. path. Anat., 1852, iv; Reizung und Reizbarkeit, ibid., 1858, xiv.

2. Von Recklinghausen: Handbuch der allgemeinen Pathologie des Kreislaufs und der Ernährung, 1883, Stuttgart, p. 238.

3. Klebs, E.: Die allgemeine Pathologie, Jena, 1889, p. 100.

4. Cohnheim: Vorlesungen über allgemeine Pathologie, Berlin, 1882.

5. Rindfleisch: Die Elemente der Pathologie, Leipsic, 1896, ed. 3, p. 28.

6. Benario, J.: Die Lehre von der trüben Schwellung, Würzburg, 1891.

7. Thoma, R.: Text-Book of General Pathology, translated by Bruce, 1896, i, 469.

8. Ziegler, E.: General Pathology, English transl. of 8th revised German edition, 1897, p. 166.

9. Birch-Hirschfeld: Lehrbuch der pathologischen Anatomie, 1896-1897, i, 64.

10. Ribbert, H. Lehrbuch der allgemeinen Pathologie und pathologischen Anatomie, 1911, ed. 4, p. 111.

11. Adami, J. G.: Principles of Pathology, 1908, i, 814.

12. Von Gierke, E.: Aschoff's Pathologische Anatomie, 1911, i, 362.

13. Landsteiner, K.: Ueber trübe Schwellung, Beitr. z. path. Anat. u. z. allg. Path. (Ziegler's), 1903, xxxiii.

corrosive sublimate, van Gehuchten's fluid, and Müller-formalin. Paraffin sections were stained with iron-hematoxylin, Altmann's stain, etc. He found that an irregular arrangement of the granules is the only characteristic change in cloudy swelling. Inasmuch as the cytoplasmic granulations, demonstrable by this technic, are, for the greater part at least, not identical with those seen in the fresh tissue, Landsteiner's results are not at all contradictory to those of other investigators. Landsteiner does not regard fat as a prominent feature in the cloudy-swollen cell, but he used only osmic acid to demonstrate its presence.

Other investigators have studied cloudy swelling experimentally produced in animals. Favre[14] in 1892 ligatured the left renal vein in rabbits. In animals that died (about one week after operation) cloudy swelling of the right kidney was noted. In animals that were killed after from twelve to eighteen days the right kidney showed little or no cloudy swelling. After ligature of one ureter he found traces of cloudy swelling in both kidneys in animals killed about two weeks after the operation. The condition was pronounced in one rabbit that died after six days.

Schilling[15] in 1894 ligatured one renal vein in the rabbit. After forty-eight hours he obtained pronounced cloudy swelling in the opposite kidney. In teased preparations the tubules are completely opaque, and the cells are enlarged and filled with an enormous number of fine granules which almost completely conceal the nuclei. The Altmann granules are not identical with the granules of cloudy swelling, but the former disappear as the latter develop.

Favre was the first to show that increased work causes a moderate cloudy swelling in the kidney, but his results are not so conclusive as those of Schilling since his animals died from complications.

Schilling showed also that the cloudy swelling is transitory and that it is best developed forty-eight hours after the operation.

Albrecht[16] in 1900 seems to have been the first to describe the coarse granules in the renal epithelium of animals. In teased preparations of fresh renal tissue, examined under an oil-immersion lens, he found inside the rodded zone a number of refractive granules varying with the species and the individual. He does not state whether or not these granules are present in the human kidney. The granules seem to have very delicate walls. He could find no mention of these granules in the literature. He supposed them to have some important physiologic function. On the addition of water or physiologic salt solution a large number of fine droplets appear in the central part of the cell, which appearance Albrecht regarded as an emulsion. In this and later papers this author lays considerable emphasis on the point that certain forms of cloudy swelling may represent an emulsion (*tropfige Entmischung*) of the cytoplasm.

Albrecht[17] in 1902 obtained cloudy swelling in the kidney of the rabbit by the following procedure: The renal artery is ligatured for two hours. The ligature is then released for two or three hours, after which it is again ligatured for twenty-four hours. A less marked cloudy swelling is obtained if the artery is ligatured for one hour and the kidney examined eighteen hours after the restoration of the circulation.

Albrecht[18] in 1903 confirmed Schilling's results in obtaining cloudy swelling in the opposite kidney after ligature of the renal vein. He obtained the same change in the opposite kidney after ligature of the ureter. He therefore interprets this type of cloudy swelling in the compensatorily working kidney as due to increased activity of the epithelium.

Wieszeniewski[19] in 1912 produced cloudy swelling in the kidney by clamping the renal artery two hours and then restoring the circulation for twenty-four hours. The tissues were stained *intra vitam* with toluidin blue. He found that the normal granules (that is, those demonstrable by *intra-vitam* staining) are somewhat decreased in number, but that some of the cells contain a number of large and small blue-stained droplets.

If only the gross features of cloudy swelling are considered there is usually no great difficulty in deciding on the presence or absence of this condition when it is well marked. It is very probable that in routine pathologic work only the gross features are usually considered. The pathologist seldom checks his gross observations on this point by microscopic examination. It was in attempting to do this that I was led into this investigation.

One of the first questions which arose was, If an organ shows the gross features of cloudy swelling, must the microscopic picture agree before this diagnosis is recorded? In the case of a young man who died of acute cerebrospinal meningitis after an illness of less than forty-eight hours, accompanied by very high fever, the necropsy, which was made within two hours after death, revealed a cloudy, somewhat yellowish liver, apparently swollen. Pieces of tissue crushed under the cover-glass, without the addition of any fluid, showed the cells much more opaque than normal in transmitted light, but the cytoplasm was crowded with a large number of small fat droplets. Only a few small albuminous granules were to be seen. The protoplasm became clearer on the addition of potassium hydroxid, but the protoplasm of normal cells will also clear markedly in this solution. The fat droplets were identified as such by their insolubility in potassium hydroxid and their staining with sudan III. The appearances presented by this organ corresponded very well to the classical description of cloudy swelling except that there was no increase of albuminous granules.

I have frequently found livers at necropsy which were similar to the one just described. It is true that they do not have a "cooked" appearance, but they are cloudy and swollen. If we adhere to the customary conception of cloudy swelling these must be regarded as examples of fatty metamorphosis associated with edema. It is to be remembered that fine fat droplets as well as albuminous granules may cause cells to appear darker in transmitted light. One has only to examine an unstained frozen section of a moderately fatty kidney to become convinced on this point. Again the dark and light fibers of voluntary muscle differ from one another mainly in the presence of a large number of fine fat droplets in the former. The increased opacity of the tissue is therefore not a safe criterion.

Benario expressed the opinion that true cloudy swelling is always associated with the presence of fat droplets

14. Favre, A.: Die Ursache der Eklampsie, etc., Virchows Arch. f. path. Anat., 1892, cxxvii, 33.
15. Schilling, C.: Das Verhalten der Altmann'schen Granula bei der trüben Schwellung, Virchows Arch. f. path. Anat., 1894, cxxxv.
16. Albrecht, E.: Zur physiologischen und pathologischen Morphologie der Nierenzellen, Verhandl. d. deutsch. path. Gesellschaft, 1900, 2d session, p. 462.
17. Albrecht, E.: Neue Beiträge zur Pathologie der Zelle, Verhandl. d. deutsch. path. Gesellschaft, 1902, 5th session, p. 7.
18. Albrecht, E.: Ueber trübe Schwellung und Fettdegeneration, Verhandl. d. deutsch. path. Gesellschaft, 1903, 6th session.
19. Wieszeniewski, W.: Veränderungen nach temporärer Abklemmung der Nierenarterie; Untersuchungen mit vitaler Färbung, Beitr. z. path. Anat. u. z. allg. Path. (Ziegler's), 1912, lili, 129.

in the protoplasm; but he seems to recognize the condition rather by the presence of the albuminous granules. Adami apparently agrees with Benario.

Another example of the uncertainty of the gross diagnosis of cloudy swelling may be seen in experimental hydronephrosis in the rabbit produced by ligature of the ureter. Forty-eight hours after the operation the corresponding kidney is greatly swollen and very cloudy. The cut surface is succulent. Usually nearly every tubule is filled with albuminous granules so that both the gross and the microscopic pictures of cloudy swelling are present; but sometimes, though the gross picture is the same, only a few granules are visible microscopically. These two conditions cannot be distinguished macroscopically. The question that arises is whether or not the second type of kidney, that is, the one with only a few albuminous granules, should be classified as cloudy swelling.

Some may argue that a condition like hydronephrosis, in which edema is so prominent a feature, should not be regarded as true cloudy swelling at all; but if one takes this position, and demands that the cut surface of an organ must be dry, then most of the lesions produced experimentally by Favre, Schilling and Albrecht cannot be classed as cloudy swelling.

It is clear therefore that the gross features of classical cloudy swelling may be present in the absence of the typical microscopic appearances. The converse also is true. The typical microscopic appearances occur when the gross features are absent. The following case will serve as an illustration: A rabbit weighing 1,776 gm. developed a large subcutaneous abscess. In nineteen days its weight fell to 965 gm. The kidneys were not swollen. The cut surface was only slightly clouded, but the microscopic examination showed nearly every cell crowded with albuminous granules. Teased preparations showed the "ground-glass" appearance described by Adami, but the gross appearance of the organ did not at all suggest such extensive changes.

A second question that arises is, Exactly what is meant when it is stated that the cells become more granular in cloudy swelling? None of the observers mentioned above seem to consider fat droplets All speak of albuminous granules. The majority evidently refer to granules visible in the fresh tissue, though this is not always clearly stated. Landsteiner, however, was describing a different order of structures when he stated that the only characteristic change in cloudy swelling is an irregular arrangement of the cytoplasmic granules. These may be called the Altmann granules. A large number of papers have appeared which consider the normal arrangement of these granules and their variations in size, number and distribution under experimental conditions.

The rods of Heidenhain are visible in fresh preparations, but the great majority of the granules shown by Landsteiner's technic and other similar procedures are not identifiable with certainty in the fresh tissue. Surely there is no close correspondence between these granules and those visible in cloudy swelling. Schilling expresses the view that the Altmann granules are not identifiable with those of cloudy swelling.

Again when Wieszeniewski finds a reduction of the normal cytoplasmic granules in cloudy swelling, he is describing structures demonstrable by *intra-vitam* staining. Whether or not these represent actual preexistent granules is a matter of debate. They are too few in number to correspond to the albuminous granules seen in unstained tissues.

Investigators who have dealt with human tissues are nearly all agreed that the granules are very small. In the publications accompanied by illustrations the granules are shown as very small.

The granules found in experimentally produced cloudy swelling, however (at least by the procedure employed by me) in the kidneys of the rabbit and the guinea-pig are much larger than those described in man. In the animals mentioned the granules are readily visible with the high-power dry lens, while the oil-immersion is required to see those in human tissues distinctly. If one begins his study on the experimentally produced lesion, he may have difficulty in recognizing the condition in human tissues, so great is the difference in the appearance of the granules. The coarse granulation was noted by me in every instance of cloudy swelling produced in the kidneys of the rabbit and the guinea-pig. The procedure employed was ligature of either the renal vein or the ureter for forty-eight hours. In a few cases of severe infection a similar coarse granulation was observed. It cannot of course be inferred from these results that a finely granular cloudy swelling never occurs in these animals.

As to the number of granules present there is some diversity of opinion. Cohnheim recognized this as a difficulty in that he stated that the condition is more readily recognized grossly than microscopically in tissues that are normally granular. Virchow stated that there is an increase of the cytoplasmic granules. Some observers say nothing as to the number of granules, apparently ignoring the fact that normal cytoplasm may appear finely granular. Thoma states that the granules are so numerous that they obscure or nearly obscure the nuclei. Adami describes the nuclei as similarly obscured by granules in advanced cases.

Several observers (Thoma, Adami) have described the appearances of cloudy swelling as visible after fixation of the tissue. Adami believes that the essential microscopic features may be seen after treatment of the tissues with the ordinary fixing reagents. While one cannot deny the truth of this for special cases, it certainly may be denied general application. In the experimentally produced cloudy swelling in rabbits I have not been able to find any fixative that will preserve the granules. They remain visible for some time in normal salt solution; but frozen sections immediately lose all the characteristic features even when examined in this medium.

The nature and source of the granules are variously given. Some have regarded them as precipitated cell proteins; others believe them to be of the same order as ordinary cytoplasmic granules. In the kidney of an apparently normal rabbit, in teased preparations, examined under low magnification without the addition of any fluid, one may see an occasional dark tubule—the great majority being relatively transparent. A stronger lens shows that all the tubules contain coarse granules; but that, while the light tubules contain only a few, the dark tubules are so closely packed with granules that their nuclei are barely visible. All of these coarse granules, perhaps better regarded as droplets, readily burst and disappear if potassium hydroxid be drawn under the cover-glass.

In cloudy swelling, produced in the rabbit by ligature of the opposite renal vein or ureter for forty-eight hours, which, judged by its gross appearance, is of moderate degree only, the number of dark tubules is greatly increased—about one tubule in every three or four is dark. The light tubules are usually unchanged. No fat is present.

Often an advanced degree of cloudy swelling may be produced in the rabbit in the corresponding kidney by ligature of the ureter for forty-eight hours. Often nearly all the tubules are dark, being filled with albuminous granules. Some fat is always present in these kidneys. Microscopically, therefore, cloudy swelling in the kidney of the rabbit is characterized by a great increase in the number of dark tubules. The dark tubules are not different in appearance from those found in the apparently normal organ. The experimentally produced lesion in rabbits differs so much from the lesion described in human tissues that one may be inclined to doubt that the two conditions are really closely related.

From a consideration of the foregoing observations it becomes apparent that cloudy swelling is by no means a definite pathologic entity. Since we have no exact means of identifying the lesion, experienced observers may disagree even as to its presence in an organ. The gross features may be present in the absence of the classical microscopic picture; and conversely the typical microscopic picture may be present in the absence of the gross features. If we demand that both the classical gross and microscopic characteristics be present before the lesion is classified as cloudy swelling, then we are soon led to make arbitrary and unreasonable distinctions.

There is no agreement at all among the various investigators as to the ultimate nature of cloudy swelling. It is evident that several pathologic processes are represented. In one type, as the compensatorily working kidney, there is increased activity of the epithelium In another form there is probably coagulation and precipitation of the protoplasm. Albrecht's emulsified condition (*tropfige Entmischung*) may represent a third form. Edema and fatty metamorphosis also play an important rôle.

It is therefore tentatively suggested that the term "cloudy swelling" be retained, as a grossly descriptive term only, to describe a cloudy, turbid, swollen organ. A qualifying phrase may then be added to describe the microscopic picture, as cloudy swelling due to albuminous granules; cloudy swelling due to fatty metamorphosis and edema; cloudy swelling due to swelling and coagulation of cytoplasm, etc. Conditions presenting only microscopic changes should be described according to their character.

SUMMARY

The gross features of loudy swelling may be present in the absence of the classical microscopic picture and vice versa.

Edema and fatty metamorphosis play an important part in the production of the gross picture.

The microscopic appearances are best judged in fresh unstained preparations not treated with any fluid.

The Altmann granules and granules stained by *intra-vitam* methods are not identical to any considerable extent with those of cloudy swelling.

The albuminous granules seen in experimentally produced cloudy swelling in the kidney of the rabbit are much larger than those commonly described in human tissues. As the lesion in this instance becomes more advanced the number of dark tubules increases—some always remaining clear. The characteristic microscopic appearances are not seen in frozen sections or fixed material.

Cloudy swelling is not a definite pathologic condition. It is suggested that the term be employed only in gross description and that a qualifying phrase be added to indicate the associated microscopic changes.

ABSTRACT OF DISCUSSION

Dr. H. Gideon Wells, Chicago: The text-book material that we have to furnish students is largely traditional as regards the retrogressive processes and contains innumerable errors, as little has been done in the field of the retrogressive processes in many years. How would Dr. Bell interpret his results in connection with the ideas of Martin Fischer in regard to cloudy swelling as the result of the action of intracellular acids on the cell? Of course cloudy swelling is nothing more or less than intracellular edema.

Dr. E. T. Bell, Minneapolis: I have not repeated Martin Fischer's work, but it seems to me that acidity might produce granules in the cytoplasm.

EXPERIMENTAL CIRRHOSIS OF THE LIVER*

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Ever since Laennec[1] first described cirrhosis of the liver, there has been an immense amount of experimental work done as to the etiology and histology of this disease. Joannovics[2] in 1904 gave a summary of the work that had been done up to that time together with a summary of the methods used. Briefly these methods as given by him can be summarized as follows: He divides all previous research into two main classes; one in which the formation and increase of interlobular connective tissue takes place with cirrhosis of the liver, and the other in which degeneration of the liver-cells takes place. He says that all operative interferences whether working on the common bile-duct, the portal vein or the hepatic artery belong to the first class, together with the injection of irritating substances into the common bile-duct or into the parenchyma of the liver itself, and also the methods that mechanically irritate the surface of the liver. In the second class he puts poisons which bring about a degeneration of the liver cells, whether given by mouth, subcutaneously, intravenously or by inhalation.

In this study of experimental cirrhosis of the liver, I have adopted Mallory's[3] classification of the five types, namely, toxic, infectious, pigmentary, syphilitic and alcoholic cirrhosis, as it seems to me that the point of view of etiology is best expressed in this manner.

For obvious reasons no experimental work has been done on the syphilitic type. The infectious type has been thoroughly worked out by Weaver,[4] Hektoen,[5] Symmers,[6] Gougerot,[7] Opie,[8] Grigorewsky,[9] Krawkow[10] and Sciagliosi.[11] Various bacteria were inoculated by these experimenters, and cirrhotic changes were obtained.

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2. Joannovics: Experimental Cirrhosis of the Liver, Wien. klin. Wchnschr., 1904, xvii, No. 27.
3. Mallory: Cirrhosis of the Liver: Five Different Types, Bull. Johns Hopkins Hosp., 1911, xxii, No. 240.
4. Weaver: Cirrhosis of the Liver in a Guinea-Pig Produced by a Bacillus and Its Products, Tr. Chicago Path. Soc., 1900, iii, 228.
5. Hektoen: Experimental Bacillary Cirrhosis of the Liver, Jour. Path. and Bacteriol., 1900, vii, 214.
6. Symmers: New Form of Liver Cirrhosis Due to the Presence of the Ova of Bilharzia Haematobia, Jour. Path. and Bacteriol., 1903, ix.
7. Gougerot: Experimental Reproduction of Tuberculous Cirrhosis of the Liver, Rev. de méd., 1909, xix.
8. Opie: Proc. Path. Soc., Philadelphia, September, 1910.
9. Dautschakoff-Grigorewsky: Ueber experimentelle erzeugte Lebercirrhose, Centralbl. f. Alig. Path. u. Path. Anat., 1904, xv, 967.
10. Krawkow: De la dégénérescence amyloïde et les altérations cirrhotiques provoquées expérimentalement chez les animaux, Arch. de méd. exper. et d'anat. path., 1896, viii.
11. Sciagliosi: Die Rolle des Alkohols und der akuten Infektionskrankheiten in der Entstehung der interstitiellen Hepatitis, Virchows Arch. f. path. Anat., 1896, cxlv.

The greatest amount of work has been done in the toxic type of cirrhosis with various substances which have a selective action on the liver-cells. A brief summary of this work with the method used in experimentally producing cirrhosis of the liver is as follows: Wooldridge,[12] proteins derived from glandular organs; Flexner,[13] dog-serum; Nothnagel,[14] chloroform; Marchwold,[15] antipyrin; Joannovics,[2] ammonium salts; Pearce,[16] immune hemolytic serum; Opie,[4] chloroform; Pilliet,[17] silver nitrate; Josselin de Jong,[18] phenol (carbolic acid); Wegner,[19] phosphorus; Mertens,[20] chloroform; Boix[21] lower fatty acids; Rovighie and Portioli,[22] carbamate of ammonium, and Ehrlich,[23] cocain.

As far as I know no experimental work has been done on the pigmentary form of cirrhosis, but after the work of Welch,[24] who showed that the presence of irritating pigment particles in the lung in brown induration and anthracosis as well as similar conditions in other organs would stimulate connective tissue to proliferation, there seems to be no need of further evidence along this line.

In regard to the alcoholic type of cirrhosis most of the evidence that we have so far has been entirely clinical. Joannovics[2] asserted that he had produced this type of cirrhosis by the inhalation of alcohol; Mertens[20] also succeeded in repeating this experiment. Friedenwald[25] with alcohol obtained cirrhosis in some animals but not in others; Straus and Blocq[26] with alcohol obtained some cirrhotic changes.

An immense amount of experimental work has been done by tying the common bile-duct or one of its branches; nearly all the observers have succeeded with this method in producing the cirrhosis known commonly as the obstructive biliary type. Most observers, however, seem to agree that the changes are due to the toxic action of the bile although they do not all agree as to its method of action; therefore, it would seem as if this all might best be included in the toxic type. Ogata[27] has carried out a long series of experiments along these lines and gives a complete review of the literature of this experimental method.

As a result of all this experimental work, one fact stands out prominently from everything else: in the toxic and infectious types the proliferation of the connective tissue which gives us finally cirrhosis of the liver is excited primarily by a repeated injury to the liver-cells. In syphilitic, pigmentary and the tuberculous form of infections there is of course direct injury to the connective tissue itself as the exciting cause. The alcohol type yet remains to be proved.

12. Wooldridge: Tr. Path. Soc. London, 1888, xxxix, 44.
13. Flexner: Med. News, 1894, lxv, 116.
14. Nothnagel: Die fettige Degeneration der Organe bei Aether- und Chloroformnarkose, Berl. klin. Wchnschr., 1866.
15. Marchwold: München. med. Wchnschr., March 26, 1901.
16. Pearce: Experimenal Cirrhosis of the Liver, Jour. Exper. Med. 1906, viii, 64.
17. Pilliet: Semaine méd., 1893.
18. Josselin de Jong: De la cirrhose du foie, 1895.
19. Wegner: Der Einfluss des Phosphors auf den Organismus, Virchows Arch. f. path. Anat., 1872, lv.
20. Mertens: Lésions anatomiques du foie du lapin au cours de l'intoxication chronique par le chloroforme et par l'alcohol, Arch. de Pharmakodyn., 1895.
21. Boix: Le foie des dyspeptiques, Thèse de Paris, 1895.
22. Rovighie and Portioli: L'azione dell'acido carbamico sull' organismo, Il Morgagni, 1899.
23. Ehrlich: Deutsch. med. Wchnschr., 1890.
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25. Friedenwald, Julius: The Pathologic Effects of Alcohol on Rabbits, THE JOURNAL A. M. A., Sept. 9, 1905, p. 780.
26. Straus and Blocq: Arch. de physiol. norm. et path., 1887, Series 3, x, 409.
27. Ogata: Beitrage zur experimentell erzeugten Lebercirrhose und zur Pathogenese des Ikterus mit spezieller Berücksichtigung der Gallenkapillaren bei der Unterbindung des Ductus choledochus und der Ikterogenvergiftung, Beitr. z. path. Anat. u. z. allg. Path., 1913, xi.

In starting the present investigation we had two things in mind: (1) to confirm if possible previous work on the toxic and infectious types of cirrhosis, and (2) to obtain some method by which the rôle played by alcohol in the causation of liver cirrhosis could be shown.

The principal experiments are as follows:

EXPERIMENT 1.—Rabbit inoculated in posterior ear vein with *Staphylococcus pyogenes aureus;* as nothing resulted, this was repeated fifteen days later. By the end of another week animal was emaciated and weak, had severe dyspnea and stiff joints, so was killed.

Necropsy showed a generalized pyemia and joint infection due to bacteria inoculated.

Sections of the liver showed considerable interlobular fibroblastic proliferation coming from both blood-vessel and bile-duct walls. The liver-cells showed albuminoid degeneration and some areas of necrosis. The intralobular blood-capillaries are dilated and filled with blood. This seems to be a good example of beginning toxic cirrhosis. No signs of infection were present although we expected to find this as a type of the infectious cirrhosis.

EXPERIMENT 2.—Three animals were anesthetized on three successive days for forty minutes. The first was killed in forty-eight hours, and showed only extensive focal necrosis throughout the parenchyma.

The second was allowed to live for twenty-eight days and then killed. Histologically there is considerable interlobular and also intralobular connective-tissue proliferation. This connective tissue in the portal spaces seems to be coming equally from the blood-vessel and bile-duct and some of it has attained adult form. There is a just beginning budding of bile-ducts.

The third animal was inoculated with 0.5 c.c. of a bouillon culture of *Bacillus coli* in the ear-vein at the time of the last anesthesia. The animal was killed after a three weeks' interval in the usual manner. Grossly the liver markings were quite prominent and the liver-pulp seemed moister than normal. The surface has a slightly roughened or irregular contour, slightly hobnailed. Histologically one finds a marked connective-tissue proliferation in the portal spaces which is beginning to infiltrate the periphery of the lobule. This proliferation seems to be coming much more rapidly from the sheaths of the portal vein branches than from the connective tissue around the bile-ducts although it is coming to some extent from this location also. Some of the portal spaces show a condition comparable to scar tissue as the connective tissue has developed to an adult type—so much so that the intercellular fibers are firm and contracted down so that the nuclei are thin and elongated. In these particular areas there seems to be equal involvement about both veins and ducts. Here also the ducts show numerous bends and some tortuosity, but the connective tissue has closed in so firmly about them that no headway is being made. In a few cases we find this cirrhotic change apparently involving only the portal veins, and in such areas the bile-ducts appear like objects that had been caught in the process and squeezed up. One would expect from this evidence of bile stasis, but none is present nor did the animal have any jaundice. In still other areas the reverse is true that the ducts seem to be mostly involved and the vessels engulfed. Throughout the whole parenchyma the supporting connective tissue is rapidly proliferating. In both the interlobular and intralobular regions there is also more or less endothelial proliferation. The liver-cells themselves appear quite granular and appear to be undergoing an albuminoid degeneration. The cells are vacuolated and have the lattice-work arrangement of the protoplasm mentioned before. The nuclei mostly take the stain very nicely, but once in a great while evidence of karyorrhexis is seen. What evidence of necrosis is present seems to be more marked about the periphery. All the blood-vessels are dilated, as are the capillaries lying between the cells. The latter are very evident, but in no place was there any evidence of rupture or hemorrhage.

This experiment seems to show that repeated injury to the liver-cells when there is infection or subinfection added will produce very quickly the conditions favorable for the development of cirrhosis. I say subinfection as the colon culture used was one long cultivated in stock and was very attenuated. The findings from this experiment agree fully with Opie's conclusions, namely, that subinfection with colon bacilli will bring about cirrhotic changes in the liver much more quickly than will injury of the same nature without the secondary infection.

EXPERIMENT 3.—A cat was operated on under aseptic conditions and the common bile-duct ligated with a silk thread. Unfortunately the bandage that was placed around the cat's abdomen became caught on a wire on the side of the cage and wounded the cat's side so that infection was set up in the thigh. This reached such an extent that the hip-joint was apparently involved and the animal got so weak and emaciated that it had to be killed at the end of four weeks so that the desired experimental period could not be obtained. At necropsy it was found that the infection was one with *Staphylococcus pyogenes aureus*, and involved the hip-joint and had extended up into the pelvis, giving an abscess between the musculature and the peritoneum—one that extended pretty well up over the brim of the pelvis.

The gall-bladder was found enormously dilated and full of bile, and the liver very much bile-stained both on the surface and on section. The cut surface was greenish and firmer than normal and the markings very distinct. Histologically the portal spaces are enormously enlarged from the extreme dilatation of the bile-ducts, which are very tortuous. The blood-vessels of the portal spaces, the central veins and the intralobular capillaries are also dilated and filled with blood. There is quite an extensive interlobular proliferation of connective tissue about the bile-ducts. The tortuosity of the bile-ducts prohibits the observation as to their proliferation. The epithelium of the ducts and the bile capillaries is much more columnar than normal and can easily be observed even in the intralobular tissue in places. There is some proliferation of endothelium but not at all marked. The whole of the parenchyma shows albuminoid degeneration and an occasional area of necrosis. These areas are round, and seem to be mostly central. There are no signs of infection in any part of the liver.

This liver seems to show the customary reaction to biliary obstruction, and I fail to see any evidence that the infection of the animal had any effect unless that manifested in the albuminous degeneration. The results otherwise agree with those obtained by Ogata and others with the same technic. It seems as if this experiment confirmed the results of those who assert that biliary cirrhosis can follow bile stasis without infection entering into the question. In this particular case had the infection any marked bearing we would certainly expect to find the connective-tissue reaction much more active in the vicinity of the blood-vessels and an infiltration with leukocytes or lymphocytes. If the toxins were to be considered we would expect more evidence of necrosis.

EXPERIMENT 4.—A rabbit was given by mouth daily except Sunday, before feeding-time in the morning, 15 c.c. of 34 per cent. alcohol. This was given with a medicine-dropper, and after a few administrations no difficulty was found in the rabbits swallowing it. By this method I endeavored to reproduce as closely as possible the conditions in the steady drinker that are supposed to predispose to cirrhosis of the liver, namely, a repeated ingestion of alcohol in the "whisky proportion" on an empty stomach. This experiment was started Nov. 4, 1912, and the animal killed April 9, 1913, covering a period of slightly over five months. Necropsy showed a liver small for an animal as large as this one (which at the beginning was a full-sized rabbit and which grew fatter and larger in the meantime, never showing any signs of being sick). The liver markings were extremely prominent and the organ was lighter in color and firmer; there was some slight roughening of the surface. The heart showed the muscle walls lighter in color than normal as was the endocardium and a sort of gluing together of the flaps of the aortic valve. Evidently there were some aortic stenosis and insufficiency. Histologically sections showed quite a large increase in the interlobular connective tissue in which there were many proliferating bile-ducts, the buds and new branches of which stood out very distinctly. In several places it was evident that these were trying to penetrate the periphery of the lobules. The blood-vessels were not particularly noticeable. The connective tissue seemed to be proliferating from the preexisting connective tissue in these portal and interlobular spaces. Some ingrowth into the lobule had taken place but was not particularly far advanced. More or less increase of the intralobular connective tissue was also observed. The cells of the liver parenchyma showed pretty much throughout a moderate degree of albuminoid degeneration. Occasionally the central part of a lobule and in one place a whole lobule had undergone a more severe change, but not far enough to be called true necrosis. With the higher power of the microscope the protoplasm of the cells has the lattice-work arrangement of threads as described previously. These threads where they crossed one another seemed to be sort of bunched up in a way similar to the nodal points in fibrin fibers. The protoplasm of the cells had a tendency to gather at the periphery of the cell along the cell membrane, and these threads intervened across the more central portion. The nuclei stained rather irregularly, having somewhat of a similar thread-like appearance of its chromatin. Karyokinetic figures were rarely observed, but a good many cells were seen with double nuclei. In some cells the nucleus was apparently lost, yet the protoplasm had the characteristic appearance already noted. An occasional cell was vacuolated, but nothing could be determined as to the contents of the same. Once in a while a cell or a group of cells would stain more brightly than the others. As some of these had double nuclei I took them to be regenerated or regenerating cells. Very rarely in the protoplasm of a cell could be made out a portion, really one of these nodal masses mentioned before, that took a brighter stain with eosin than the others. It seemed to me that this might possibly be a beginning of that hyaline skein-like degeneration that Mallory believes to be pathognomonic of alcoholic cirrhosis.

The intralobular blood-capillaries were dilated and their walls could be fairly well made out. The endothelium of these as well as that of the lymph-spaces in the portal regions is actively proliferating.

It seems as if this experiment gives at least suggestive evidence that alcohol, *per se*, has a deleterious effect on the liver and that as a result of this effect cirrhotic changes occur. It is true that no others have been able to obtain just this result, but I believe that with the same technic others will get the same results. A long series of experiments is necessary before absolute conclusions can be drawn, and such experimentation is to be undertaken. Hence the question is still open until the results of further research can be announced.

EXPERIMENT 5.—Another animal was treated in the same way for four months, but at the end of the third month was inoculated with 0.5 c.c. of a bouillon culture of *B. coli* in the ear-vein. Histologically the liver shows a beginning of cirrhosis but much less than the last. The bile-ducts have not yet undergone any change, thus showing that bile-duct proliferation is a later process than the proliferation of connective tissue. The colon bacilli seemed to have no influence, thus acting contrary to the results obtained with it in chloroform necrosis.

CONCLUSION

It seems as if our results confirm those of previous investigators as to the toxic type of cirrhosis and as to the infections when combined with the toxic. Our results with the obstructive biliary type we are unable to place in either of these two classes, but in general they are the same as obtained by other observers.

It seems as if we had demonstrated a method by which the alcoholic type can be produced. Our series of experiments as to this is so short that, of course, no absolute conclusion can be reached. Therefore we desire merely to give this as a preliminary report of progress in an investigation undertaken and which is to be continued for a long time.

SUMMARY

I have given a brief review of some former experimental work on cirrhosis of the liver and have noted that in accordance with Mallory's classification of the disease the pigmentary and the syphilitic, the toxic and the infectious types had been fairly well worked out from an etiologic point of view.

This investigation of ours has in its limited way confirmed the results as to the toxic, particularly as to the infectious and to the so-called obstructive biliary types of the disease.

I furthermore believe that we have obtained a method by which the alcoholic types may be reproduced experimentally and have given this method and its results entirely as a preliminary report.

ABSTRACT OF DISCUSSION

DR. HENRY ALBERT, Iowa City, Iowa: Thus far, a typical cirrhosis of the liver by the use of alcohol has not yet been produced experimentally. The work of Opie in the production of cirrhosis is exceedingly suggestive and it was largely with the idea of using alcohol instead of chloroform as the initial agent that Dr. Grover started his work. I think that Dr. Grover has succeeded in obtaining a better example of a purely alcoholic cirrhosis—in which nothing but alcohol was used—than has previously been obtained, and we shall all be interested in the experiments which he is now continuing.

DR. H. E. ROBERTSON, Minneapolis: Some time ago we started out in this laboratory doing experiments on alcoholic cirrhosis, and we were compelled at that time to discard the rabbit for use in these experiments because of the numerous sclerotic conditions which occurred in this animal, not only in the vessels but in the kidneys, liver and heart; we found that the rabbit was a very uncertain animal for use in investigations of this kind. I do not question at all that the chances are this present experiment may be the result of the use of alcohol, but I suggest that these results be carefully controlled by various other animals at various ages before definite conclusions are drawn. We turned our attention to dogs as having livers of more normal content and used young dogs in order to be certain of that point. We carried on experiments lasting over a year in a number of dogs, feeding them alcohol each day and at the end of the week giving them a larger dose, so that the dogs were not only chronic drinkers, but they went on a spree at the end of every week. At the end of these periods we found apparently no change in the liver. There was not the slightest possibility of inference that there was any production of fatty tissue.

DR. A. L. GROVER, Iowa City, Iowa: I have found two references in the literature in regard to rabbits sometimes showing sclerotic changes that cannot be accounted for, one by Joannovics and another by Christian. In necropsies on about forty rabbits last year, we found two rabbits that showed sclerotic changes in the liver and in both those cases we could account for it by the fact that there was enough else the matter with the rabbits. One died under anesthesia and the other died from infection. The one that died under anesthesia had a condition of the kidney which showed that the rabbit had some toxic infection, while the second had more or less of a pyemia. Those are the only rabbits that we have been able to find showing sclerosis. Our rabbits come from a good many litters and there is no reason why they should not represent pretty much all the conditions.

ATTEMPTS TO TRANSMIT POLIOMYELITIS BY MEANS OF THE STABLE-FLY (STOMOXYS CALCITRANS)*

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In a discussion before the Fifteenth International Congress on Hygiene and Demography, Sept. 26, 1912, Rosenau[1] reported that he had been able to transmit a disease in all essential respects like poliomyelitis, through the agency of the biting stable-fly, from monkeys purposely infected with poliomyelitis to six out of twelve well monkeys used in his experiment. At the time of this announcement parts of California were passing through a severe epidemic of poliomyelitis,[2] and the problem of preventing the spread of the disease was of especial concern to the State Board of Health. If the stable-fly was the chief disseminator of poliomyelitis, very important steps were not being taken, while unnecessary preventive measures, some of them very burdensome, were being enforced. The State Board of Health at once laid plans for an investigation to determine the extent to which it should consider the stable-fly in measures for preventing poliomyelitis, and suggested to Thomas Forsyth Hunt, dean of the College of Agriculture and director of the Agricultural Experiment Station of the University of California, that a joint investigation be carried on by the State Board of Health and the experiment station. This was agreed on, and it was decided to begin at once, as it was considered important that evidence should be available for practical application before another summer could bring a fresh outbreak. The cold winter of the Eastern states was apt to interfere seriously with the experiments which were being carried on there, while the milder climate of California would permit the securing of abundant fly-breeding material during most of the year. These facts were additional reasons for taking up the work here.

Before the experiments could be started Anderson and Frost[3] reported the confirmation of Rosenau's demonstration that poliomyelitis may be transmitted from sick to well monkeys through the agency of the biting stable-fly. In their experiments, three healthy monkeys were bitten by stable-flies which had been allowed to bite two other monkeys sick with poliomyelitis after intracerebral inoculation. All three of the healthy monkeys developed poliomyelitis nine or ten days after the inoculation of the first of the two which were experimentally infected. In Rosenau's announcement he stated that the monkeys showed symptoms of poliomyelitis several weeks after the flies, which were biting them frequently, had had their first opportunity to receive infection from sick monkeys. This would allow abundant time for a definite biologic change in the virus, preparing it, during the incubation in the fly as intermediate host, for successful inoculation into the warm-blooded monkey.

* From the Hygienic Laboratory of the California State Board of Health and the Laboratory of Parasitology of the University of California.

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Such a process seemed not an improbable explanation of the results when we considered that Rosenau was dealing with a blood-sucking insect and a disease in which the blood had been shown to have very low infectivity on direct inoculation. The symptoms of poliomyelitis in the experiments of Anderson and Frost appeared so soon after the first possible transference of infectious material that in all probability the process consisted of a mechanical transference of blood or other infectious material taken up by the flies while repeatedly piercing the skin. The extreme shortness of time available, in their experiments, for incubation of the virus in the fly is apparent when we consider that, in the interval of nine or ten days, we must allow also for the development of the virus in the original, inoculated monkeys and for the incubation period in the monkeys infected by the flies. Our experiments were undertaken to determine the conditions under which the stable-fly could transmit poliomyelitis and to learn whether the process was a more or less accidental mechanical transference, or one which involved a specific biologic change of the virus in the fly.

GENERAL TECHNIC

The monkeys used in our experiments were kept separate in roomy fly-tight cages with inner walls of coarse wire netting and outer walls of fly screening. When a consignment of monkeys was first received they were given an insecticide bath in a dilute cresol preparation and then placed in cleaned and disinfected cages. With a few exceptions they were kept under observation for from one to four weeks before being put under experiment, and this precaution was justified by the development of various fatal diseases in four of the animals during the preliminary observation. Every day each monkey under observation or experimentation had its temperature taken and was weighed in a bag which had been sterilized in the autoclave since its previous use. When the monkeys were placed on the animal board for fly-feedings or for ether anesthesia preparatory to inoculation, the board was first protected with a sterilized sheet perforated with holes through which the disinfected neck-holder could project. The arms and legs of the monkey, while it was on the board, were held by attendants, one wearing a pair of leather gloves, used only in handling that individual monkey, and the other using rubber gloves which had been boiled. Jars containing the flies were applied to the abdomen and chest, which were washed (whenever indicated by the plan of the experiment) to prevent the transference, on the jars, of saliva or other possibly infectious material from the surface of one monkey to that of another. The rooms in which the monkeys and rabbits were kept were specially screened at the windows against flies and were provided with screened vestibules at the doors.

No flies caught in the open were used in the feeding experiments. The importance of this was shown by some preliminary observations for which stable-flies were caught around barns in Berkeley. These flies were fed on a normal rabbit from Oct. 18 to 27, 1912, when the last of them died. The next day it was noticed that the rabbit had lost weight, and on October 30 it died. The ears showed scaling lesions near their bases, where the flies had bitten, a condition not noticed in any of the rabbits used for feeding larger numbers of flies bred in the laboratory. There were no other definite lesions discoverable at necropsy, and cultures from the heart's blood on nutrient broth and agar remained sterile.

A second rabbit was used for continuing the feedings of some laboratory-bred flies which had fed previously on the rabbit which died. This rabbit showed symptoms of weakness and scaling lesions similar to those of the first rabbit between November 4 and 7, after which date it seemed to improve. On November 14 weakness returned and it died November 16. At necropsy a large abscess was found, extending externally to the thoracic wall on the right side from the median line in front almost to the backbone. The abscess extended under the scapula. A small bacillus was found in large numbers in the pus.

Flies which had fed on the second rabbit were fed up to December 16 on a third rabbit. On January 7 this rabbit was examined and was found to have a large abscess similar in extent to that of the second rabbit. This abscess finally discharged spontaneously and the rabbit recovered. Mr. Harold F. Gray, to whom we are indebted for many of the observations just cited and for other assistance during our experiments, attempted to transfer the infection still further to other rabbits through the medium of the fly, but the animals remained well. He showed the identity of a bacillus abundant in the pus of the second and third rabbits. The organism was a Gram-negative, polar staining, non-motile, hemophilic bacillus. Although it did not belong to the influenza group, it possessed many of the characteristics of the members of that group.

This experience is given as an instance in which stable-flies very probably transmitted to a rabbit a pathogenic organism which they had previously acquired while free in nature. It strengthened our determination to exclude flies caught in the open from our experiments and so to avoid this additional risk of complicating them, although the previous experimenters along the same line had used both caught and laboratory-bred flies without apparent introduction of extraneous infections.

The flies used were hatched in jars from larvae and, to a less extent, from pupae found in decaying hay and other vegetable matter around dairies and stock-yards. The breeding material was kept at from 23 to 26 C. (from 73.4 to 78.8 F.) in an insectary specially devised for this work. As the flies hatched they were transferred in lots of fifty to wide-mouthed quart fruit jars. The jars were then permanently sealed with a piece of bobbinet, the edges of which were drawn down over the sides of the jar and firmly held by an encircling band of adhesive plaster. The flies were fed by inverting the jars and holding them until the flies were satisfied (usually from twelve to thirty minutes) against the abdomen and chest of a monkey or rabbit which had been placed on an animal board. The flies usually were eager to reach their proboscides through the bobbinet and to suck the blood until their bodies were distended, and we experienced no difficulty in keeping most of them alive in the jars for a reasonable length of time.

EXPERIMENT 1.—The first experiment was undertaken to confirm Rosenau's observation of the transmissibility of poliomyelitis through the agency of the stable-fly, and more especially to throw light on the question whether we are dealing with a specific process of development of the virus in the fly, or a more immediate mechanical transference, or both. The first step was an attempt to find out the exact length of time that the virus must be in the fly before its bite can produce a successful inoculation, and also the limits of the period or periods during which the fly is infectious.

Monkey 2 was inoculated intracerebrally on Dec. 16, 1912, with poliomyelitic virus M A, for which we are indebted to Dr. Flexner and Dr. Clark of the Rockefeller Institute. On

the following day, and every day thereafter until the death of Monkey 2 from poliomyelitis on December 21, five new jars of flies were fed on his abdomen and chest. On the day he died flies in three such sets of five jars each were fed, at intervals of several hours. After the feeding of the flies in each set of five jars, the flies in one jar were fed at once on normal Monkey 3. Another jar was kept twenty-four hours and the flies then fed on Monkey 4. The third was kept for two days and the flies then fed on Monkey 5. The fourth was kept four days and the flies then fed on Monkey 6. The fifth was kept eight days and the flies then fed on Monkey 7. After the flies in the first jar had fed on Monkey 3, it was set aside and, sixteen days after the original feeding on Monkey 2, the flies were fed on Monkey 8. In all the jars the flies that survived twenty-nine days after their single feeding on Monkey 2 were thereafter fed daily on Monkey 14 until his death from pneumonia on Jan. 20, 1913. On January 23, his place was taken by Monkey 15, on whom the remaining flies fed daily until they died. The last fly died on February 1, forty-five days after its feeding on Monkey 2.

When a set of flies had to be kept for more than forty-eight hours without feeding on a monkey, they were fed on a young rabbit used only on that one day.

If the virus of poliomyelitis was freely circulating in the blood of Monkey 2 at any time during the development or height of the disease, there was a good chance that some of the flies allotted to each of the other monkeys would take up the virus.

In no instance were we able to demonstrate that poliomyelitis had been transferred from Monkey 2 to one of the other monkeys. Monkeys 3, 4, 5, 6, 7 and 8 were kept under observation for 70, 62, 112, 115, 106 and 101 days, respectively, and were then transferred in good condition to other experiments in this series. During the periods of observation these monkeys remained entirely well except Monkey 6, which had a few attacks of diarrhea associated wtih subnormal temperature and, in one instance, with a convulsion. Monkey 14 died from pneumonia and pneumococcus septicemia five days after the first time that flies had fed on him. Monkey 15 died sixty-six days after the first time that flies had fed on him. The cause of death was not poliomyelitis, as was proved by post-mortem examination and by inoculation of some of the cord tissue intracerebrally into another monkey. Later in this report will be found individual records for each of the monkeys.

Seventeen young rabbits, which were used for feeding the flies in this experiment, were under observation for from four to eight weeks, and all remained well except two that died of coccidiosis eighteen and thirty-three days after they had been used.

Having failed in Experiment 1 to transmit poliomyelitis through the agency of the stable-fly, Experiments 2 and 3 were devised to give the flies increased opportunity to transfer the disease.

EXPERIMENT 2.—Monkey 9 was inoculated intracerebrally on Jan. 8, 1913, with poliomyelitic virus M A from Monkey 2. On the same day Monkey 9 was immobilized by being wrapped in chicken-fence wire and was laid in a large pan. He was then put through a cloth sleeve into a screen-walled insect cage measuring 45 cm. in height and in width and 71 cm. in length. In this cage 500 recently hatched stable-flies had been released. Monkey 9 was exposed in this way for two hours daily up to January 11, the day of his death from poliomyelitis. Beginning on the day following the inoculation of Monkey 9 another monkey, No. 11, was exposed daily to the same flies in the same way until the last flies died on January 14. The flies in this experiment did not do nearly so well as flies bred at the same time and used in jars in Experiment 3. The flies sat most of the time on the screen walls of the cage and very few were seen to feed. As a consequence they died off very rapidly, most of them within three days, and the last survivors succumbed on January 14, after the exposure of Monkey 11 on that day.

These flies, as well as the flies used in Experiments 3 and 4, were kept in the insectary at from 23 to 26 C. (from 73.4 to 78.8 F.). The high temperature was used because it would probably have favored any development of the virus in the fly. In the other experiments the flies were kept at room temperature, which ranged from 8 to 27 C. (from 46.4 to 80.6 F.), but lay between 12 and 20 C. (53.6 and 68 F.) most of the time.

As the flies in the first experiments ate better and lived longer in the jars than in the cage, the later experiments were carried on with flies in jars only.

Monkey 11 remained well during an observation period of ninety-five days after the last fly-feeding, and he was then used in a later experiment. Poliomyelitis was not transferred by flies in this experiment, which was unsatisfactory owing to the high mortality among the flies.

EXPERIMENT 3.—In this experiment Monkey 9, which had been inoculated with poliomyelitic virus M A on January 8, as already described in Experiment 2, and normal Monkey 10 were placed side by side on animal boards. Fifteen jars of flies were fed for three-minute periods alternately on the two monkeys, beginning on No. 9. The flies were fed until satisfied, and this took usually from fifteen to twenty minutes. Some of the flies were allowed to feed on the face of Monkey 10. Face inoculations in rabies, a disease in many respects like poliomyelitis, give an increased chance for infection and a comparatively short incubation period. The feedings began on the day that No. 9 was inoculated, January 8, and continued January 9 and 10. Monkey 9 died early on January 11. Thereafter the flies were fed daily on the abdomen, chest and face of Monkey 10 until the last flies died on January 29. Monkey 10 died forty days after the first fly-feedings. Necropsy and the inoculation of cord tissue into a normal monkey ruled out poliomyelitis as the cause of death.

We had failed to transmit poliomyelitis through the medium of stable-flies even when they were allowed to bite the sick and the well monkeys in rapid alternation, and to bite the face, as well as the chest and abdomen, of the healthy monkey.

EXPERIMENT 4.—In this experiment inoculation tests were made to determine the presence of poliomyelitic virus in the stable-fly immediately after feeding on the blood of an infected monkey and several days later. As the blood itself is seldom infectious on inoculation, and then only when used in large quantities, we did not expect to demonstrate the virus in the flies which had just fed, but we wished to determine whether or not a development of the virus in the fly would permit successful inoculation later.

On January 10, eleven jars of freshly hatched flies were allowed to feed on Monkey 9, which was at that time showing severe symptoms from poliomyelitis. Thirty flies visibly distended with blood were selected from these jars. They were immediately chilled, ground up in a mortar with 7 c.c. of physiologic salt solution, and passed through a Berkefeld filter; 5 c.c. of the filtrate was inoculated into both frontal lobes of Monkey 12.

Later a filtrate was similarly made of ninety-eight flies from sets which had fed on Monkey 9 at the height of his disease four days before. Many of the flies had fed on him also one day earlier. The flies had been kept in the warm insectary and had been fed several times during the interval. Four c.c. of this filtrate were injected into both frontal lobes of Monkey 13. He remained well during an observation period of eighty-nine days and was then used in a later experiment.

Monkey 12, four days after he had been inoculated with fly-filtrate, suddenly developed general weakness and twitching of the extremities. He died a few hours later. Post-mortem examination, including microscopic examination of the cord, showed no evidence of poliomyelitis. Some of the cervical cord, after preservation in 50 per cent. glycerol (glycerin) was inoculated into another monkey, which did not develop poliomyelitis.

In this experiment we had failed to produce poliomyelitis in two monkeys inoculated intracerebrally with ground and

filtered flies which had fed on the blood of a monkey sick with poliomyelitis. In one instance the flies had just ingested the blood, and in the other they had bitten the infected monkey four and five days before. Unfortunately death from causes other than poliomyelitis did not allow a reasonable observation period for the monkey inoculated with the flies which had fed immediately before.

EXPERIMENT 5.—After a delay due to the scarcity of fly-breeding material in the last half of the winter, Experiment 5 was undertaken to test again the ability of the stable-fly to transfer poliomyelitis by sucking blood from the clean skin of an infected monkey and subsequently biting a normal monkey. Monkey 13 was inoculated intracerebrally with poliomyelitic virus M A on April 13. Beginning the following day seven jars of flies (increased to eight the next day) fed for twelve minutes daily, alternating for three-minute periods between the cleaned abdomens or chests of Monkey 13 and normal Monkey 5. This experiment was duplicated by similar feedings on Monkeys 13 and 7. After the death of Monkey 13 from poliomyelitis on April 18, the fly-feedings were continued on the other two monkeys. The death of Monkey 5 on May 19 interrupted the feedings of one set of flies. The cause of death was not poliomyelitis, as was shown by necropsy findings, to be given later, and by inoculation of brain and cord-tissue into a normal monkey with negative results.

The last of the flies which fed on Monkey 7 died on June 13, two months after the first feedings. On June 16, Monkey 7 was used in another experiment, but continued to remain normal.

The flies had failed to transmit poliomyelitis through frequent alternate bitings of sick and well monkeys followed by daily feedings on healthy monkeys.

EXPERIMENT 6.—It was thought that possibly the results of the previous investigators had been due to the access of the flies to infectious material on the surfaces of the diseased monkeys and about their body orifices. This was not improbable as nasal washings and feces had frequently been shown by other investigators to contain the virus. Experiment 6 began on April 14 and was exactly parallel to Experiment 5, except that the abdomen and chest of Monkey 13 were painted, before the fly-feedings, with a mixture of his saliva, his feces, and (late in the disease) his nasal washings in physiologic salt solution. After his death from poliomyelitis on April 18, a rabbit was substituted for Monkey 13 and was painted with the same mixture. After April 21, the rabbit was no longer used and the flies fed only on the two normal monkeys, Nos. 8 and 3. Monkey 3 died on May 2 from other causes than poliomyelitis, as was shown by post-mortem examination and inoculation of cord-tissues into a normal monkey. The last of the flies feeding on Monkey 8 died on June 16, over two months after the beginning of this experiment. Monkey 8 was still well and under observation on July 31, 1913, one hundred and eight days after the first fly-feedings.

Poliomyelitis had not been transferred to well monkeys by flies which had bitten in rapid alternation well monkeys and a sick monkey, painted with his own nasal washings, feces and saliva.

EXPERIMENT 7.—This experiment had the same purpose as Experiment 6 and was parallel to it except that an emulsion of the highly infectious brain-tissue of Monkey 13, dead of poliomyelitis, was used in place of the mixture of nasal washings, feces and saliva, and a normal monkey was painted instead of one sick with poliomyelitis. An emulsion in physiologic salt solution was made at first with the fresh brain-tissue, later with brain-tissue which had been in 50 per cent. glycerin. Normal Monkey 4 was painted with this suspension, and flies were fed on Monkey 4 and 11 alternately and also similarly on Monkeys 4 and 6. After the daily feedings the virus was carefully washed off. The feedings through virus on Monkey 4 lasted for sixteen days, from April 19 to May 4, and after that the flies fed on the other monkeys only. The last of the flies which fed on Monkey 11 died on June 15 and the last of those feeding on Monkey 6 succumbed two days earlier. Monkey 4 was still well and under observation on July 31, 1913, one hundred and three days after the beginning of the experiment. The other two monkeys were used on June 16, fifty-eight days after the beginning of the experiment in other parts of the investigation. They remained well, as will be seen in their individual records.

Poliomyelitis had not been produced in a well monkey by stable-flies even when they had to drive their proboscides through a layer of highly infectious brain-tissue in order to pierce the skin. The same flies did not transmit the disease on subsequent bitings of two other monkeys.

RECORDS OF THE MONKEYS IN BRIEF

MONKEY 2.—*Macacus rhesus*, 3,300 gm., about a year old. Used in Experiment 1. Inoculated intracerebrally with virus M A on Dec. 16, 1912. On December 21, profound weakness, paralysis of left side of face and of extensors of right elbow. Died same day. Cord showed on microscopic examination marked infiltration with lymphocytes and polymorphonuclear leukocytes around the blood-vessels and throughout the gray matter; destruction of many ganglion cells; numerous small hemorrhages in the gray matter. Monkey 2 evidently died of poliomyelitis.

MONKEY 3.—*Macacus rhesus*, 2,100 gm., about a year old. Used in Experiments 1, 3 and 6. In Experiment 3 he was inoculated intracerebrally on February 25 with the cord-tissue of Monkey 10 in order to test it for the virus of poliomyelitis. Remained well until May 2. On that date, while being used in Experiment 6, he showed marked weakness and rigidity of the extremities. Died in the afternoon. Necropsy showed enlargement of axillary, inguinal and mesenteric lymph-nodes. Slight cutaneous and subcutaneous hemorrhages where the flies had fed. Old peritoneal adhesions. Microscopic examination of the cord showed no departure from the normal. On June 16, 2 c.c. of a heavy emulsion of his cervical cord was inoculated intracerebrally into Monkey 6, which is still normal forty-five days later, July 31, 1913. The evidence shows that Monkey 3 did not die of poliomyelitis.

MONKEY 4.—*Macacus rhesus*, 2,800 gm., about a year old. Used in Experiments 1, 4 and 7. In Experiment 4 he was inoculated intracerebrally on February 22 with cord-tissue of Monkey 12 to test it for the presence of poliomyelitic virus. Two days later he developed pneumonia. In three days he was again well. Still healthy on July 31, 1913.

MONKEY 5.—*Macacus rhesus*, 2,700 gm., about a year old. Used in Experiments 1 and 5. Became weak on April 19. Pupils became dilated on April 21 and he seemed to be blind. Improved on May 2. On May 18 the symptoms became aggravated. Died May 19. Necropsy showed general enlargement of lymph-nodes. Old peritoneal adhesions. The brain showed soft tissue bulging in small areas from the left anterior lobe externally and into the median fissure. On section the regions of both lateral ventricles were markedly hemorrhagic. Other areas of the brain were dotted with minute hemorrhages about 0.3 mm. in diameter. On microscopic examination the tissue showed no abnormality except the hemorrhages. Cultures of the brain-tissue remained sterile. The cord was normal on microscopic examination. Two c.c. of a heavy emulsion of tissue from the brain and cervical cord, kept in 50 per cent. glycerol, were inoculated intracerebrally, July 16, 1913, into Monkey 7, which was still normal forty-five days later, July 31. Monkey 5 did not die of poliomyelitis.

MONKEY 6.—*Macacus rhesus*, 1,600 gm., aged about 10 months. Used in Experiments 1, 7 and 6. In Experiment 1 he had a subnormal temperature, attacks of diarrhea, and one convulsion between January 1 and 4. In Experiment 6 he was inoculated intracerebrally on June 16 with 2 c.c. of a heavy emulsion of the cervical cord of Monkey 3 to test the tissue for the presence of poliomyelitic virus. Monkey 6 was still healthy and gaining in weight, July 31, 1913.

MONKEY 7.—*Macacus rhesus*, 2,600 gm., aged about 12 months. Used in Experiments 1 and 5. On June 16 he was inoculated intracerebrally with 2 c.c. of heavy suspension

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of brain and cord-tissue from Monkey 5 to test the tissue for the virus of poliomyelitis. Monkey 7 was still in excellent condition on July 31, 1913.

MONKEY 8.—*Macacus rhesus*, 2,100 gm., about a year old. Used in Experiments 1 and 6. On January 7, hemorrhagic spots, where flies had bitten him a day or two before, were very marked and appeared in many places as red circles, from 0.5 to 1 cm. in diameter, with centers of normal skin. Still normal on July 31, 1913.

MONKEY 9.—*Macacus rhesus*, 2,900 gm., about a year old. Used in Experiments 2, 3 and 4. Inoculated intracerebrally with 2 c.c. of heavy emulsion of virus M A from Monkey 2 on January 8. On January 10, profound general weakness, twitching of extremities, subnormal temperature. Died January 11. Brain and cord normal on inspection. Sections showed little change in the cord except moderate infiltration of the meninges with lymphocytes and polymorphonuclear leukocytes. Monkey 9 died of poliomyelitis after intracerebral inoculation.

MONKEY 10.—*Macacus rhesus*, 2,200 gm., about a year old. Used in Experiment 3. On Feb. 14, 1913, he showed marked general weakness. In the examination of his blood 158 normoblasts were counted while a differential count of 200 leukocytes was being made. Hemoglobin, 55 per cent. of normal. Red corpuscles, 3,300,000 per cubic millimeter. Marked poikilocytosis, polychromatophilia and stippling. Died February 17. Necropsy showed old peritoneal adhesions. Cultures from heart's blood remained sterile. The cord on microscopic examination appeared to be normal. Two c.c. of a heavy emulsion of cervical cord was injected, February 25, into the frontal lobes of Monkey 3, which remained normal up to transference to another experiment forty-eight days later. Monkey 10 did not die of poliomyelitis.

MONKEY 11.—*Macacus rhesus*, 1,900 gm., about a year old. Used in Experiments 2, 7 and 1. In Experiment 1 he was inoculated intracerebrally on June 16 with 2 c.c. of a heavy emulsion of cervical cord of Monkey 15 to test the tissue for poliomyelitic virus. Monkey 11 was still normal on July 31, 1913.

MONKEY 12.—Java, 1,900 gm., about a year old. Used in Experiment 4, as already described. On January 14 he showed twitching of the extremities and pronounced weakness, and four hours later he died. Necropsy showed slight evidence of laceration and hemorrhage in the frontal lobes where the fly-filtrate had been injected. Sections of cervical, dorsal and lumbar cord showed no lesions on microscopic examination. On February 22, 3 c.c. of a heavy emulsion of the cervical cord (preserved in 50 per cent. glycerol) was inoculated intracerebrally into Monkey 4, which remained well for fifty-seven days up to transfer to another experiment. Monkey 12 did not die of poliomyelitis.

MONKEY 13.—*Macacus rhesus*, 4,800 gm., an adult several years old. Used in Experiments 4, 5, 6 and 7. For the last-named three experiments he was inoculated intracerebrally, April 13, with virus M A from Monkey 2. Three days later his right pupil was dilated. The next day his pupils were small. He showed paralysis of the upper part of the left side of his face and was unable to close his left eye. Left leg weaker than right. Died the same day. Necropsy showed ecchymoses where the flies had fed. Mesenteric lymph-nodes enlarged. Blood pale. On section the cord showed visible hemorrhage and swelling in the gray matter. On microscopic examination the cord showed marked infiltration of the gray matter with inflammatory cells, numerous hemorrhages and moderate destruction of ganglion cells. The cause of death was evidently poliomyelitis.

MONKEY 14.—Java, 1,700 gm., aged about 10 months. Used in Experiment 1. On January 19 he became quiet and showed twitching of extremities and face. The following day there was profound weakness, subnormal temperature, drowsiness and rapid, labored, grunting respirations. A blood-smear showed many lanceolate diplococci, and a reduction of the polymorphonuclear leukocytes from 61.8 to 8.5 per cent. of the white corpuscles, which were reduced in total number. Died January 20. Necropsy showed enlarged and slightly hemorrhagic lymph-nodes in axillae and groins. Many subperitoneal ecchymoses. Old peritoneal adhesions. Roundworms in the walls and lumen of the large intestine. Spleen enlarged, dark and firm. Lungs only slightly collapsed. Upper lobes firm, dark red, and abnormally moist on section. Lower lobes showing beginning engorgement. Smears from the spleen showed Gram-positive lanceolate diplococci, and similar organisms were found in the lung. The brain and cord appeared normal on inspection. Death was due to pneumonia and pneumococcus septicemia.

MONKEY 15.—Java, 1,800 gm., about a year old. Used in Experiment 1. On March 25, 1913, he began to have attacks of syncope and slight convulsions. Marked weakness on March 29. Found dead next morning. Necropsy showed no lesions of special interest. Sections of the cord on microscopic examination seemed normal. On June 16, 2 c.c. of heavy emulsion of the cervical cord were inoculated intracerebrally into Monkey 11, which was still healthy on July 31, 1913. Monkey 15 did not die of poliomyelitis.

NOTES ON THE STABLE-FLY

During the fall and the first half of the winter we found abundant larvae and pupae in moist decaying alfalfa and grain hay in the bottoms of outdoor feeding-troughs for cattle. Larvae and pupae were plentiful also in wet hay siftings under a large dairy-barn and at the bottom of a stack of hay piled in an inadequately drained horse-barn. Larvae were found in wet middlings which had accumulated beside a mixing-trough in a dairy, in a pile of decaying onions, and in a wet mixture of decaying weeds and grass. *Stomoxys* larvae and pupae were rare in manure, a favorite breeding-place for the house-fly. This shows that the measures successful in the control of the house-fly are not adapted to the suppression of the stable-fly, as the two insects differ in their choice of breeding-places.

From the middle of January to the middle of March, breeding material adequate for our experiments could not be found. Prolonged search revealed only occasional pupae and very few larvae. On March 26 we began to find large numbers of young *Stomoxys* larvae in wet decomposing hay in sunny spots on the ground beside feed-troughs, and in a pile of decomposed refuse, chiefly hay and straw, which had been thrown from a dairy barn. After this date we had no trouble in obtaining plenty of fly-breeding material.

With few exceptions, we found on the premises of twelve poliomyelitis patients, whom we were able to visit during the fall and winter, stable-flies varying in number according to the season and the proximity to domesticated animals. It is probable that in California stable-flies can be found wherever there are cattle or other domesticated animals to supply the needed blood. We observed a few of the adult flies in the middle of winter.

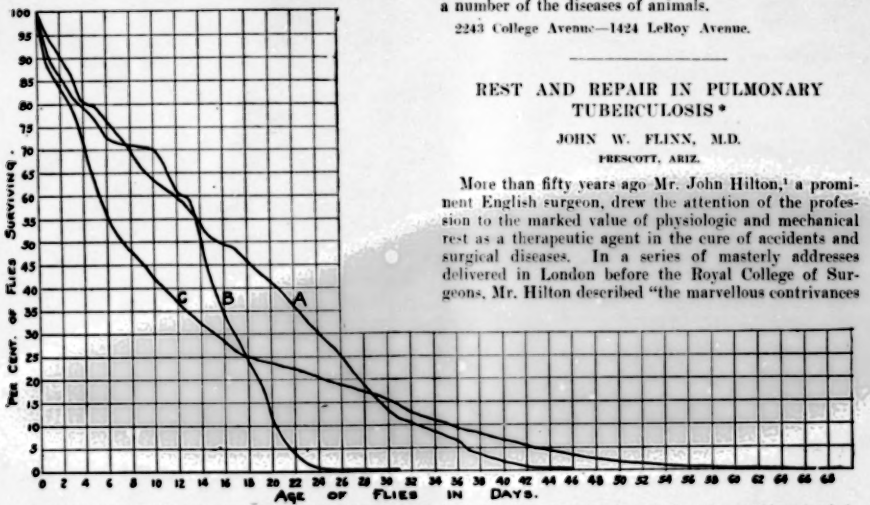
In the study of the life history of the stable-fly (*Stomoxys calcitrans*, Linn.), we observed that, in the insectary at from 23 to 26 C. (from 73.4 to 78.8 F.), female flies deposited eggs on the eighteenth day after their emergence from the pupa cases. The number of eggs deposited varied from 25 to 124, but it was most frequently between 30 and 35. Usually the flies died a few days after ovulation. A set of flies which were fed only on sugar-water deposited no eggs, although many of them lived twenty days or longer, while control flies fed on blood did lay eggs.

The incubation period in eggs kept at from 16 to 25 C. (from 60.8 to 77 F.) varied from two to five days and was commonly three days. The newly hatched larvae buried themselves in the breeding-material, being

strongly negatively heliotropic. The larvae required much moisture. They grew slowly, compared to house-fly and flesh-fly larvae, reaching full growth in from fourteen to twenty-six days (usually about eighteen), depending on moisture, light and temperature. Before pupation the larvae crawled up into the drier layers of the decaying vegetable matter in which they developed and became pupae in less than one hour after they had begun to change. We found the pupal period at from 23 to 26 C. to vary from six to twenty-six days, but usually to lie between nine and thirteen days.

The total time, at 21 C. from the laying of the egg to the hatching of the adult fly was from thirty-three to thirty-six days, as observed in five individuals.

The length of life of the flies, under the favorable conditions of feeding in our principal experiments, was, on the average, twenty days. The maximum was sixty-nine days, and was observed in a female fly.



Longevity chart of Stomoxys calcitrans: A, percentage curve of 1,300 stable-flies surviving on each day after hatching; hatched between December 12 and 20, 1912; used in Experiment 1; room temperature, usually between 12 and 20 C. (53.6 and 68 F.). *B*, percentage curve of 650 stable-flies surviving on each day after hatching; hatched between Dec. 22, 1912, and Jan. 3, 1913; used in Experiment 3; insectary temperature, from 23 to 36 C. (from 73.4 to 78.8 F.). *C*, percentage curve of 2,000 stable-flies surviving on each day after hatching; hatched between April 7 and 18, 1913; used in experiments 5, 6 and 7; room temperature, usually between 12 and 20 C.

The three longevity curves plotted in the accompanying chart show the percentage of survivors at all ages in three large groups of flies under different conditions of season and temperature.

CONCLUSIONS

1. In a series of seven experiments in which the conditions were varied, we were unable to transmit poliomyelitis from monkey to monkey through the agency of the stable-fly.

2. Further experimentation may reveal conditions under which the stable-fly can readily transfer poliomyelitis, but the negative results of our work and of the second set of experiments of Anderson and Frost[4] lead us to doubt that the fly is the usual agent in spreading the disease in nature.

3. On the basis of the evidence now at hand we should continue to isolate persons sick with poliomyelitis or convalescent, and we should attempt to limit the formation of human carriers and to detect and control them. Screening of sick-rooms against the stable-fly and other flying insects is a precaution which should be added to those directed against contact infection, but not substituted for them.

4. The measures used in suppressing the house-fly are not applicable to the control of the stable-fly owing to its different breeding habits and food-supply. Methods should be devised for diminishing the numbers of stable-flies as they are a great annoyance to cattle and, in all probability, are capable of transferring and inoculating a number of the diseases of animals.

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4. Anderson, John F., and Frost, W. H.: Poliomyelitis: Further Attempts to Transmit the Disease through the Agency of the Stable-Fly (*Stomoxys calcitrans*), Pub. Health Rep., Washington, May 2, 1913, xxviii, 833.

REST AND REPAIR IN PULMONARY TUBERCULOSIS *

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More than fifty years ago Mr. John Hilton,[1] a prominent English surgeon, drew the attention of the profession to the marked value of physiologic and mechanical rest as a therapeutic agent in the cure of accidents and surgical diseases. In a series of masterly addresses delivered in London before the Royal College of Surgeons, Mr. Hilton described "the marvellous contrivances which Nature has employed for securing rest to the different organs of the body when in health," and "the instinctive promptings of Nature to secure rest on the occurrence of accidents or diseases."

Mr. Hilton says:

"So intimate is the association between rest and growth as to make them appear on a superficial view to stand to each other in relation of cause and effect. Accurate observation of the animal and vegetable world certainly reveals their perpetual coexistence; and growth as a rule seems *pari passu* with physiological rest." "A homely illustration may be found in the fact that in infancy the child who sleeps much mostly thrives. *Mutatis mutandis* the observation is equally true that the wakeful restless child seldom displays the evidence of active nutrition. Doubtless all will admit that in infancy development is in its highest state of activity and

* Read in the Section on Practice of Medicine of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

1. Hilton: Rest and Pain. Geo. Bell & Sons, London, 1907.

that the healthy infant passes the greater portion of its life in a state of rest and sleep. Growth—the renewal of some parts and the fresh development of others—seems thus to claim sleep and rest as its helpmates." "Growth is the ante-type of repair prefiguring the physiological capabilities of existing structures to repair themselves." "Repair is but the repetition of growth. The same elements, the same kindred conditions are necessary to the same results. Rest is the necessary antecedent to the healthy accomplishment of both repair and growth."

He pointed out that in acute and chronic inflammations of the soft tissues, injuries to bones and joints, and in most surgical diseases the object of treatment is to bring about rest of the injured parts. Surgeons soon began to recognize the supreme importance of rest as a therapeutic agent, and to-day[2] "the surgeon entirely relies on rest, after his operation, to heal the wound he made."

REST IN MEDICINE

Physicians, on the other hand, have been wondrous slow to appreciate what rest can accomplish in preventing and curing disease. In 1874, Weir Mitchell began to develop his rest treatment for neurasthenia and hysteria, and through his influence absolute rest in bed was first given a recognized place in medical therapeutics. In acute fevers from whatever cause, in chronic diseases of the heart, of the kidneys, and lately in chronic gastro-intestinal affections, rest in bed is an integral part of treatment; and yet it has apparently occurred to but few that the same treatment is just as necessary in chronic disease of the lungs.

Although Hilton in 1860 demonstrated conclusively the value of physiologic rest in acute and chronic inflammations with or without abscess formation, and although the experience of surgeons from that day to this has served only to verify and emphasize these views, the profession has apparently utterly failed to recognize the fact, that physiologic rest of the lungs must be of the very first importance in the treatment of chronic inflammation and abscess formation in the lung tissue. One will search American medical literature in vain for any extended reference to the value of rest in the treatment of pulmonary tuberculosis, or for definite information regarding its use. With the exception of the little work[3] by Norman Bridge published in 1903 and a few scattered papers, practically nothing has been written on this important subject. Bridge was strongly impressed with the value of rest to the lung tissue, but unfortunately was content with mechanical measures for producing this rest, such as "to inflate the pleural cavity with sterile air or nitrogen gas after the manner of Murphy" or "by means of adhesive bandages applied about the chest to nullify the motion of the ribs on the affected side" or "a perfectly fitting unyielding jacket or splint embracing one side of the chest," either of the latter two be worn for several months. While such mechanical measures are of undoubted benefit in some instances, they are applicable only to a limited number of cases. Nevertheless, these views were a marked step in advance, and probably did a great deal toward suggesting the larger possibilities of physiologic rest of the whole structure of the lung.

Within the last two years the operation of artificial pneumothorax has been revived, and experience has shown it to be of distinct value but only in a limited field. Perhaps the greatest ultimate good which will come from this method of treatment will be its effect in teaching the profession the value of rest to the lung in all cases of pulmonary tuberculosis. As Bushnell[4] says: "The best proof of the value of rest in progressive tuberculosis is furnished by the results of pneumothorax, which are, that the diseased lung is greatly benefited by compression; but if the non-compressed lung contains too much tuberculosis it is damaged by the increased activity forced on it by the collapse of its fellow. The experience in pneumothorax thus constitutes a beautiful double proof of the efficacy of rest."

REST IN BED

The questions naturally arise: Is it possible to give physiologic rest to the lungs? If so what means are at our disposal to induce such rest? So intimately are the lungs and heart, in their functions, connected with each other and with every other organ of the body that it is impossible to rest them without giving rest to the body as a whole. Consequently the recumbent position is the one means of giving rest to the lungs. Rest in bed alone will give the required rest to the diseased lung tissue. In pulmonary tuberculosis the word rest should always signify rest in bed. The very first rule in the treatment of pulmonary tuberculosis should be: Put your patient to bed!

For what class of cases should rest in bed be prescribed? For absolutely every case without exception. So soon as manifest tuberculosis can be detected in any patient, that person should be confined absolutely in bed for at least one month, and in the great majority of cases for two months, and this regardless of whether there is fever or not. This preliminary treatment of a month or two in bed will accomplish more than any other factor in starting the patient on the road to permanent recovery. Rest in bed improves the appetite, aids digestion and assimilation, increases the weight, lowers the temperature, slows the pulse and respirations, lessens the cough, decreases the expectoration, allays nervous irritability, and conduces to natural sleep. Surely a therapeutic measure which will produce such results should be used in every case without exception.

GRADED REST

And rest should be prescribed in definite quantities, just the same as drugs and other therapeutic agents. Written instructions should be given patients stating what degree and how many hours of rest should be taken each day. It is a distinct advantage to recognize three grades of rest in bed: 1. If the temperature does not go above 100 F., or the pulse above 100, at any time during the day, the patient may be allowed to get up in his bathrobe and bedroom slippers to make his toilet in the morning, and to go to the bathroom to evacuate his bowels and bladder, provided the bathroom is immediately adjoining. His meals should be eaten sitting up in bed. The remainder of the day should be spent lying flat. If the temperature is not above 99.5 F., reading in the recumbent position may be indulged in for a few hours each day. 2. With a maximum temperature between 100 F. and 101 F., or a pulse persistently above 100, the toilet should be made in bed, a urinal used and the patient allowed out of bed only to move his bowels. No reading should be permitted. 3. When the temperature reaches over 101 F. or the pulse 110 at any hour of the day, the patient should not be permitted even to sit up in bed. The urinal and bed-pan should be used, and the patient should be washed and fed by a

2. Leach: Therap. Gaz., Feb. 15, 1913.
3. Bridge: Tuberculosis. W. B. Saunders & Co., Philadelphia, 1903.
4. Bushnell: Personal letter.

nurse. A temperature over 102 F. demands, in addition, the ice-cap, and, if necessary, cold sponging.

When a certain grade of rest does not bring the maximum temperature below 100 F. in two weeks, the next higher grade of rest should be tried. Loss of appetite, indigestion, lassitude, sleeplessness, and nervous irritability are all indications for a greater degree of rest.

Objection will probably be made that individualization should be used; that hard-and-fast rules can not be formulated which will apply to every case. This is only partially true. Individualization *is* important, but individualization based on definite principles. Moreover, the power to individualize properly comes only with experience; the inexperienced should follow the general rules closely and allow exceptions to them only when it has been definitely established that the rule is not proving beneficial.

TUBERCULOSIS GENERAL AS WELL AS LOCAL

In searching for facts which will enable the physician to determine how much longer than the initial one or two months, rest in bed should be continued, it is important to remember that pulmonary tuberculosis is, except in its very early incipiency, a constitutional disease affecting the whole body, as well as a local disease of the lungs. In addition to the local symptoms (cough and expectoration, and often pain, hemoptysis, and dyspnea) there are present in a large proportion of cases, loss of appetite, lassitude, elevation of temperature, acceleration of pulse, loss of weight, chills, and night sweats. It is these evidences of systemic infection which especially demand rest in bed, and the rest should be continued until all constitutional symptoms have disappeared. Keep the patient in bed until the temperature and pulse are normal and until he has about regained his normal weight. While, in most early cases, the constitutional symptoms will disappear after the first one or two months in bed, later cases require four and six months, and often a year or more, in the recumbent position. I have seen one case in which the disease was arrested after three consecutive years in bed.

Not only is rest in bed of supreme importance in the treatment of active tuberculosis of the lung, but it continues to be a valuable remedy after the lung lesion has become quiescent and the patient is taking active exercise. Two hours absolute rest in bed in his night clothes should be given every patient under exercise each afternoon, until he returns to his former work. The experience of Patterson[5] of Frimley is strong evidence of the value of rest in bed after active exercise, while his observations on the effect of his "complete immobilization" in bed to combat the effect of what he terms "excessive auto-inoculations" constitute one of the strongest proofs extant of the great value of absolute rest in bed in the treatment of systemic infection in pulmonary tuberculosis.

And even after the patient has returned to his former occupation, one hour's rest in the recumbent position preferably in bed in his night clothes after the noon-day meal, should be insisted on, unless his circumstances are such that it seems absolutely impossible for him to do so. In all cases, his evenings should be spent lying in the recumbent position and his Sundays should be spent in bed for some months after returning to work. In many cases, a day in bed in the middle of the week, is necessary to enable the patient to attend properly to his work during the remaining five days. The observance of these rules will do much to prevent such recurrences of the disease as have been so woefully prevalent in the past, recurrences which came principally because patients were not advised of the necessity for a large degree of rest for months and often years after returning to their former occupations.

5. Patterson: Auto-Inoculation in Pulmonary Tuberculosis, James Nesbeth & Co., London, 1911.

THE ESSENTIALS OF TREATMENT

Although much good work has been done in the last ten years on the influence of serums, vaccines, and other special treatments in pulmonary tuberculosis, so much has been written along these lines that the profession is apt to forget that fresh air, good food, and rest are still the sine qua non of treatment in this disease. They are the principal working tools of the craft, and surely it is the part of a master-workman to perfect himself in the use of these, rather than to neglect them in experimenting with instruments many of which are of doubtful utility.

The truly wonderful therapeutic effects of fresh air and good food have long been known to the profession, but rest is an agent the use of which physicians have been slow to recognize. As all three are of such importance it is indeed difficult to compare them. Perhaps one can not better express their relative importance than by a paraphrase. In the treatment of pulmonary tuberculosis there now abideth fresh air, good food, rest, these three; but the greatest of these is rest.

ABSTRACT OF DISCUSSION

DR. CHARLES L. MINOR, Asheville, N. C.: The truths of medicine are so beautiful that when we realize any special one we are apt to be absolutely blinded by it to the existence of other truths. I am glad to hear the importance of rest emphasized before a body of medical men, because the great sin in the treatment of tuberculosis is abuse of exercise. We can also have the abuse of rest, and I am afraid that unless there be some limitation of the extremes to which doctors would push rest, it might become somewhat of an abuse, although, as I say, it is distinctly safer to err on this than on the other side." There are exceptions to everything and when the doctor says that in every case, from the beginning, the patient should always have extreme rest in bed, he is going too far. We realize perfectly that, whatever the state of the patient, he should be at rest for two or three weeks so that the physician can study the case. If the infection is beyond a certain degree, moreover, we realize the importance of rest for a longer time. The tendency to keep the patient absolutely at rest for too long a time is apt, in my experience, to unfit him for a return to work, for which he must be trained and prepared by varieties of exercise. I have seen a number of patients treated by competent men who have been kept at rest and fattened up so unduly that they could not resume work. I would not force exercise too far, but it seems to me that Dr. Flinn is extreme in stretching rest too far. Let us strike a happy medium.

DR. S. A. KNOPF, New York: I wonder if Dr. Flinn has thought of tuberculosis also as a social problem and what it would mean and what cost it would involve to have the more than one and a half million tuberculous patients in the United States put to bed, some for six months, some for a year, and some for three years. It is now well known that for every one of the two hundred thousand deaths we have annually from tuberculosis in the United States we have about eight living tuberculous patients, a goodly number of them still doing their work and supporting their families, others without families supporting themselves, and thus not a burden to the community. Professor Cabot has inaugurated a wonderfully efficient social-service system in connection with the work in the Massachusetts General Hospital. He, of course, looks after the physical welfare of the patients, but

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he also investigates thoroughly their social conditions and judiciously watches and guides the earning activity of the patient. Those who are able are permitted to work only enough not to do them any harm, and that is the policy all modern phthisiotherapeutists are bound to follow. I agree with Dr. Flinn that a patient whose temperature is 100 or more must be in bed and rest, but not every case of tuberculosis is febrile and the patient need not be in bed. In the Municipal Sanatorium at Otisville we have several hundred patients, nearly all of them in the earlier stages of the disease. We have few nurses and servants. The institution owes its inception to Prof. Hermann M. Biggs of New York; it is he who conceived the idea of utilizing the patients' ability to work, not only for their own good, but also to reduce the cost of their maintenance. The result is that we have a goodly number of cures and that the Otisville Municipal Sanatorium is considered to-day one of the most economically and successfully conducted institutions in the United States. When the patient arrives at Otisville, he is carefully examined and, whether febrile or afebrile, allowed to rest for a week. After a while, if continually afebrile, he is put to work. He is carefully watched by the physician of his division and only with concomitant improvement of his condition are his working hours increased in number. The experience of Patterson at the Frimley Sanatorium in England, King of Loomis, and, if I am rightly informed, of Beach in the sanatorium of Minnesota, and the work in Otisville and many other institutions would indicate that occupation therapy or autotuberculin inoculation in pulmonary tuberculosis is a most valuable means of accomplishing a cure in a goodly number of cases. Of course, we must individualize.

DR. JOHN RITTER, Chicago: Dr. Norman Bridge of California, at the tuberculosis meeting in Washington some years ago, brought out the fact that we are too much in the habit of having our patients practice pulmonary gymnastics, when we should institute and advise pulmonary rest. I believe that when the lung is incapacitated we should use judgment and institute rest, as a surgeon does in the case of a tuberculous knee-joint or hip-joint. The lung is damaged, the heart is weakened, and the toxic condition of the body all require rest. I think that Dr. Flinn is right, but that this method of rest may have a tendency to make a large class of lazy, idle tuberculous persons.

DR. F. M. POTTENGER, Monrovia, Cal.: Dr. Flinn, in my estimation, has laid down a carefully devised plan by which he no doubt obtains excellent results. Every man has a certain way of working and by his method arrives at certain conclusions and obtains certain results. This does not necessarily mean that his method is best. It probably is best for him, but we must be careful not to draw a general conclusion from any one set of observations. I use a great deal more rest in treating tuberculosis than I ever did before. I put patients to bed now that I would not have thought of putting to bed several years ago. I would advise all who are attempting to treat men and women who have been leading active lives to put them to bed when beginning treatment. This is the easiest way to gain control of the patient. If patients are permitted to be up and around it is almost impossible to get thorough control of them. I put patients to bed for at least a week whether they have fever or not. If I find that they are not adjusting themselves correctly to the enforced rest, I keep them there longer. I have taken men of affairs who had been extremely busy and put them to bed for one or two months and in this way changed them from nervous, energetic business men to cooperating patients. The greatest thing in the treatment of tuberculosis is to individualize. If there is any place where common sense is needed, it is in treating these chronic cases, in which you are compelled to put up the fight, not only with the patients but also for them, to guide them in every act of their life, not for a few days or a few weeks, but for months and often for years. Tuberculosis is not the only question to consider. It is an accident that has happened to a human being. If this is borne in mind and the patient treated as well as the disease, it will add greatly to successful treatment.

DR. THOMAS H. HAY, Stevens Point, Wis.: It seems to me that there has been a misconstruction of Dr. Flinn's paper on the subject of rest. It has been said that he did not display any special effort to individualize in the application of rest. It seems to me he did individualize, for he stated, as I remember, that he treated some patients in bed for one week, some for two weeks, some for three months and some for even a year, and he does not make it a rule to treat every patient in bed for three years; that was a single case. My own experience is that there is no therapeutic agent which is so neglected as the application of rest to the tuberculous patient. Why the social and economic aspects of tuberculosis should influence the application of therapeutic measures I cannot understand. It has no more to do with the case than has the social aspect of typhoid, pneumonia or any other disease. I cannot understand why tuberculosis should be treated in such an imbecile and idiotic way by the medical profession as it has been for generations. It is a common thing to see patients go to their graves without any rest; in fact, it was a common observation that in prevous years a considerable number of tuberculosis patients died in a chair, and many now die sitting up, if they do not die on the street. I think that Dr. Flinn's attitude on the question of rest is perfectly reasonable. We should do as Dr. Pottenger says, and I am glad to see that he has learned the value of rest and is employing that knowledge more than he did in former years. I am a firm believer in the broader application of rest. I have seen many cases which responded to the rest treatment in three weeks and some in three months. I have in mind a case in which the patient was in bed for about sixteen months, and to-day he is perfectly well, doing an amount of work proper for a normal, well-regulated person. Dr. Flinn should have stated what he understands by absolute rest, and the proper application of the principle of rest and what he means by it. Dr. Dewey of Wauwatosa remarked to me that the majority of people make hard work of absolute rest. The majority of people do not know what it means. It means rest in bed, without visitors, without reading, without talk and without thought, if that is possible. I tell the patients to go to bed and count the knots in the ceiling, because it is no mental or imaginative effort to do so.

DR. RICHARD C. CABOT, Boston: So much has been said about rest that I want to put in a word. Think what happens to an arm if you put it in splints. Atrophy of the muscles occurs, and when you take a roentgenogram of the arm you wonder if the bones are diseased. Rest sometimes does great harm. It is not the only physiologic principle of healing. Exercise is another and often more important principle. Rest may mean destruction and the breaking down of tissue. These theoretical conclusions, however, should not influence us in the practical question of treating tuberculosis. The only question is, does it help? If the absolute rest treatment can be shown by Dr. Flinn, or any one else, to produce better results than any other plan, then of course we must do the best we can to get these better results. I think most of us who have treated tuberculosis know that we have to individualize. We have to consider the psychic side—the mental side. That is what we mean by the social problem. There are some people who become so neurasthenic and so lazy as a result of our treatment that we give them back to society in a worse condition than when they came to us. It is doubtful whether we have done the community any good by restoring them to society as so-called "cured" persons.

DR. JOHN W. FLINN, Prescott, Ariz.: I am firmly of the opinion that it is a great pity that men holding prominent positions in the profession do not emphasize the rest treatment of tuberculosis more than they do. I believe that they are responsible for a great deal of harm that is being done throughout the country, which we notice especially in the Southwest. In regard to individualizing, it seems to me that in the past, the cart has been put before the horse. My plea is to lay down general principles, to lay stress on those principles, and, after we have learned them thoroughly, then begin to individualize. One of the greatest faults with the treatment in the past has been that we have been individualiz-

ing without principles. Dr. Cabot has asked for results and I believe that I can show them. In spite of everything that has been said to the contrary, I am still of the opinion that in active tuberculosis rest is the most powerful therapeutic agent we have at the present time. And I have serious doubts as to whether it is possible to push it to extremes so long as the disease is active. You might notice that the word "exercise" was not mentioned in the paper. When it is time for exercise I am as firm a believer in it as anybody, but I do not believe in exercise so long as the tuberculosis is active. So long as it is active I do not believe you can push the rest to an extreme.

EPIDIDYMOTOMY

THE RADICAL OPERATIVE TREATMENT OF EPIDIDYMITIS

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No operative procedure which has been recently suggested has given more gratifying results to both the surgeon and the patient than that for the relief and cure of acute epididymitis. The comparatively easily attained results are all that could be desired by the surgeon and are almost miraculous in the immediate relief they bring to the suffering patient. The relief is so immediate as to render the continuance of the internal administration of sedatives and opiates as well as the loathsome external applications entirely unnecessary. After the operation, the abatement of the fever takes place in twenty-four and not more than forty-eight hours, as a rule, and in from four to eight days the patient is able to resume his usual duties if not too violent. In view of these facts, and since I believe that this operation is devoid of risk to the patient's life, if accomplished with proper aseptic surgical surroundings, it seems to me that it should be the procedure of choice.

Epididymotomy (incision and opening of the epididymis) is an entirely rational procedure based on an accurate study of the pathology of the existing lesions. The catarrhal inflammation present causes the secretion of a varying quantity of serous fluid by the tubular glands of the epididymis, and frequently there is an exudation of some of this fluid into the tunica vaginalis, forming a hydrocele. The usual symptoms of the disease, swelling, tenderness, pain, dragging, etc., are proportionate to the amount of fluid secreted. Consequently, the liberation of the fluid from its sacs of restriction immediately relieves all symptoms.

It is customary for patients with epididymitis to appear for treatment some days after the onset of the symptoms, when pus and abscess formation will in all probability be present. If, however, the disease can be arrested in its first stages by the method under consideration, this pus and abscess formation can usually be avoided. Thus it argues that in an attack mild in character and seemingly amenable to medicinal treatment, the operative plan is more expedient, obviating as it does the possibility of future development of pus and abscess; but if the disease has progressed to the point of pus, this pus is usually confined in the intertubular connective tissues, and the abscess formed is small. It is rare that the focus of the abscess is large except in old and neglected cases. Again, the judicious method of treatment is to open the abscess and liberate the pus.

The operation which I perform is one of comparative simplicity, being a modification of that suggested by Hagner of Washington, D. C. The time required for its accomplishment is short, rarely being more than from five to ten minutes. The preparation of the patient is the same as that for the administration of a general anesthetic, as local anesthesia is not advisable. The local sterilization of the scrotum may be accomplished in any satisfactory manner, but I have always used the simple method of applying a weak alcoholic iodin solution (from 2 to 3 per cent.) after the parts were properly shaved; always with the precaution of applying the iodin solution only after the skin is thoroughly dried.

The incision in the scrotum is made over the most prominent portion of the swelling. It varies usually from 2 to 4 inches, but should be of sufficient length to allow of the delivery of the testicle, which is wrapped in cloths moistened with warm sterile water or saline solution. A small incision is made in the tunica vaginalis which allows the fluid of the hydrocele to escape. Then the portion of the epididymis which is inflamed is punctured in numerous places with a blunt probe or grooved director. This relieves the tension by allowing the restricted fluid to escape. If pus is present, it will be seen escaping from the punctures, in which case an incision is made in the epididymis in its longitudinal axis to allow free drainage. A probe directed into the pus focus with the addition of mild pressure will free the focus of the greater parts of the pus. After thorough washing of the organ with warm normal saline solution, a short drain composed of a half dozen strands of silkworm gut is inserted into the pus focus. The testicle is returned to the scrotum, which has previously been cleansed with warm normal saline solution, the subcutaneous tissues united by one or two sutures of small catgut, and the skin united by silkworm gut sutures, with the drain passing out at the lower angle of the wound. When the swelling is great, it may be necessary to observe certain precautions to prevent the silkworm gut sutures from tearing out of the inflamed friable tissues, in which case I make use of the button suture, which fulfils this requirement admirably.

After the operation, a simple gauze dressing is applied which I change at the end of forty-eight hours, when I remove the drainage, if present. During this period a T bandage supports the scrotum. One other gauze dressing is usually all that is necessary and is removed on the fifth or sixth day following the operation when the silkworm gut sutures are removed. Most patients are fitted with suspensory bandages and allowed to be out of bed from the third to the fifth day and return to their usual duties from the fourth to the eighth day.

If no pus focus is discovered, the testicle is returned to the scrotum with no drainage, the convalescence being simpler and quicker.

The immediate results of this operation in acute cases are astonishing. The pain vanishes at once, the swelling disappears rapidly, and the tenderness subsides with the swelling. The patient is comfortable from the time he recovers from the anesthetic.

The remote results of the operation are just as remarkable when it is considered that relapses never occur. In a series of one hundred cases, in which I have operated in twenty-five, I know of no relapses. The most gratifying results occur in acute cases or in cases in which the tissues have not become permanently swollen and indurated. The pain is relieved instantly in all cases, but the less the induration, the more rapid and complete will be the return to normal in size and shape of the testicle, and the less apt there is to be occlusion of the vas deferens and the epididymis with the resulting sterility, especially if the attack be bilateral.

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I am unable to state the influence of epididymotomy on sterility. But from the logical point of view it appears to me that a patient will have a far greater opportunity to recover without the occlusion of the vas deferens or epididymis if the continuity of the inflammation is aborted and the products of the inflammation are removed. I cannot understand how the operation itself would cause the obliteration of either the vas deferens or the epididymis. Any influence it has shortens the course of the disease and carries away the products of the inflammation. Doubtless it has the same beneficial effect on the retaining of a patulous canal as it has on the disease itself.

In conclusion, it is my belief that epididymotomy should be the treatment of choice in all cases of epididymitis, whether caused by traumatism or by infection with either the gonococcus or other organism. Every case from the mildest to the most severe should be operated on as:

1. The relief from pain is instantaneous.
2. Internal administration of sedatives and opiates and loathsome external applications are unnecessary.
3. The abatement of fever takes place in from twenty-four to forty-eight hours.
4. Pus and abscess formation is prevented.
5. Swelling, tenderness and other symptoms rapidly disappear.
6. There is no tendency to relapse.
7. It insures a minimum of time lost from usual activities.
8. There is probably a smaller percentage of sterility following the disease.

MENTAL DEFICIENCY AND DELINQUENCY

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Just now, while the vice question is being considered from so many sides and various causes for sexual immorality are being studied, with the hope of improving conditions if possible, it will not be amiss to direct attention to one group of young girls who for some reason have been unable to cope with the conditions confronting them and so have "gone wrong." Special stress is being laid on such causes as inadequate wages, and natural immoral tendencies on the part of the girls themselves as being important contributory factors. The State Training School for Girls at Geneva has at present a population of approximately four hundred children, the vast majority of whom have been committed for sexual immorality, and of whom, on admission, nearly 60 per cent. are suffering from a venereal disease.

Why has all this immorality occurred? At present it is of course impossible to answer this question absolutely, but there is one great cause which has never received the consideration to which it seems entitled, namely, mental deficiency.

Most of the children sent to Geneva have been held as purely delinquent. With the exception of those coming from the Juvenile Court in Chicago, none have received a mental examination, and if it has been recognized that they are not "bright," it has been noted merely as an incidental fact, not as having a bearing on the child's delinquency. The child is sent to Geneva with the idea that a year or two, or perhaps five, of hygienic existence, with good food, regular hours of sleep and an abundance of fresh air, will eliminate the immoral tendencies and give that physical and mental impetus which may make possible a wholesome, useful womanhood.

It will be well to explain here that by no means all of the girls who come into the courts find their way to Geneva. With the establishment of juvenile courts for the hearing of all cases of this kind, there has developed a tendency to continue the hearings from time to time, either allowing the child to remain in her own home or placing her in some suitable family home subject to the friendly supervision of a probation officer. So successful has this system become that only a comparatively small proportion of the girls appearing in the juvenile courts ever enter an institution, and those who do finally arrive in Geneva are, as a rule, incorrigible offenders whom the courts have entirely failed to control. As an exception to this general type of old offenders may be taken a certain number of cases sent from communities which have no system of juvenile supervision, and which frequently commit girls for very minor offenses or even because of simple financial dependence. This custom of sending dependent children or those guilty of the mildest offenses to an institution, compelling them to associate there with hardened offenders and degenerates, cannot be too severely condemned. The majority of the inmates in Geneva, then, are those who have failed to respond to the ordinary measures of supervision possible in their own homes and constitute a comparatively small percentage of all of the cases which the courts handle.

Simple observation and daily work with these girls showed a surprisingly large number who were quite irresponsible and were totally unable, even after having been given years of careful attention, to do the work of normal children either in or out of school. Recognition of this fact led to the routine application of the Binet tests, as modified by Dr. Goddard for American children, to all new subjects admitted, for the purpose of making a rapid estimate of the mental status of the children. The results obtained were startling and indicated that mental deficiency was associated with delinquency in a far larger number of cases than even the most pessimistic had supposed.

Of the total number examined, 105, or 89 per cent., were graded as feeble-minded, that is, showed a retardation of three years or more; seven, or 6 per cent., were backward, being one or two years retarded; and six, or 5 per cent., were graded as normal. It will be remembered that dependent as well as delinquent children may be sent to Geneva, and since three of the normal and five of the backward children were simply dependent, the number of feeble-minded among the delinquent become even more striking. Of the 118 children admitted, fourteen were committed as dependent or as uncontrollable at home, and none of these had been sexually immoral. Of the 104 remaining, all of whom had been sexually immoral, 101 were graded as feeble-minded and three as normal. According to the Binet tests, then, 97 per cent. of the children sent to this institution because of sexual immorality are feeble-minded as well.

Of this group of delinquents by far the larger proportion are of the weak-willed, irresponsible type, who react readily to whatever environment may surround them. These girls are usually friendly and anxious to please everyone and frequently do very well under careful supervision, but when left to their own resources they are a constant menace to themselves and to society. As an example of this type we have Pearl S., who was 18 years old when sent to Geneva and for some months previously had been working at a meager wage in an overalls factory. During this time she had repeatedly

been immoral and had become infected with both gonorrhea and syphilis. She did not know why she had been "bad," but "couldn't help it." The court committing her understood her wretched physical condition and sent to Geneva the recommendation that she be allowed to return to her home after having received thorough treatment for these diseases. Mentally this girl graded as an imbecile. Of a decidedly different type is Helen L., who, although only 10 years old, has most vicious and aggressive sexual tendencies. She is not the passive victim as is Pearl S., but so strong are her perverted impulses that she must be watched constantly to keep her from indulging them. Mentally this child, also, is an imbecile.

Besides these two types, both of which are not uncommon, although the first predominates, there occurs a third very puzzling and very dangerous type. These are the children who have been variously designated as constitutional inferiors, moral imbeciles, and so on. Of the cases examined, three apparently belong to this class. On casual contact and as graded by the Binet tests, these girls show no evidence of mental defect, and except for severe venereal infections they have no evident physical abnormality. All had bad records, were so-called "repeaters"; that is, had been brought into court again and again. Two of them, both 16 years of age, were inclined to be boastful of their escapades and pleased at the privilege of reciting their experiences. Neither is of an unstable, vacillating disposition, but both have since shown themselves to be natural leaders, easily controlling the activities of the girls with whom they are thrown in contact. The first of these three girls, Margaret M., repeatedly said that she was "bad" because she wanted to be, and that she was going back to her old life as soon as she left Geneva. The second, Hannah D., some time after her admission, told the following story: Her father controlled a teaming business and had several teamsters at work under him. When Hannah was a child of but 8 or 9 years he used to take her with him while he paid his men. After several visits of this sort, the father began to permit the child to go to the barn unaccompanied and distribute the wages; this she did for many months. Looking up here from her narration, she said, "You know what those teamsters are. How could I help but be bad?" Whether this story is sufficient explanation of the cause of this girl's immorality cannot be told, but such associations at a very impressionable age must certainly have had a strong influence on her character.

The third girl, Florence J., is more easily understood. She is a bright, nice-looking girl of only 15 years, but is easily influenced and very superficial. When questioned as to the reason for her wrong doing, she asserted that it was because "the rest all did" and that she "couldn't help it."

TABLE 1.—CONSECUTIVE ADMISSIONS

Total No. examined	118	100 per cent.
Normal	6	5 per cent.
Backward	7	6 per cent.
Feeble-minded	105	89 per cent.

TABLE 2.—SEXUALLY IMMORAL

Total No.	104	100 per cent.
Feeble-minded	101	97 per cent.
Normal	3	3 per cent.

SUMMARY

1. Of the 104 girls committed to Geneva as sexual delinquents, 101, or 97 per cent., were feeble-minded according to the Binet tests. This would seem to prove mental deficiency to be an important causative factor in the causation of sexual immorality and to indicate the routine employment of a mental examination for all children of this class in order to determine how far they may be held responsible.

2. Of the feeble-minded, comparatively few are aggressive sexual perverts, but most are helpless victims, who should have protection, and who, under close supervision, may lead useful, contented lives.

3. By no means all delinquent girls are feeble-minded, but probably those not amenable to supervision and direction in their own homes are largely so.

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FURTHER OBSERVATIONS WITH A SACCHAROMYCES *

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In August, 1912, I published a paper[1] relating the facts in connection with my observation of fifteen cases from which an organism was isolated which I identified as a saccharomycete. This organism, which was pathogenic for white mice, all varieties of rabbits, guinea-pigs and rhesus monkeys, had been found in the sputum of patients with anomalous lung conditions, and also in a tonsil-membrane, a vaginal discharge and in a skin abscess. In most of these cases it was found mixed with other organisms, but in a few it was the only apparent cause of infection, and in these cases a disappearance of the organism was followed by alleviation and disappearance of symptoms. That report left much to be desired in the way of clinical observation of cases, necropsy reports and blood examinations. Since that time, other cases have come under my observation which have been more carefully studied, two of which I cite here.

CASE 1.—Miss A., aged 61, referred by Dr. Huntington, was a native of Cleveland, where she resided most of her life. From childhood she had had frequent attacks of what she had been told was pneumonia. For the past three years she had been suffering from a chronic cough. Two of her family had died twenty-five years previously with what was then called "consumption," and this woman believed herself to be a victim of the same disease, though she admitted that experts both in Cleveland and in Chicago had examined her sputum for tubercle bacilli, but always with negative results. Early in November, 1912, she had an attack of pneumonia, and her physician, fearing that she could not endure the winter in Cleveland, urged her removal to a warmer climate. Accordingly she left her bed and came directly to California, reaching Pomona, November 14.

The patient was very weak but had borne the journey fairly well. She was tall, slender and stooping, and weighed but 83 pounds. Clinical examination showed marked involvement of the left lung, which seemed to be mostly consolidated. Posteriorly, there was pleuritic pain with rigidity of the muscles of the back. The temperature, which at first ranged from 98.4 to 102.6 F., finally remained stationary at 99.4. The pulse varied between 80 and 102 and was sometimes irregular and weak. The respiration was from 20 to 26. The cough was exhausting and the voice husky, with sometimes complete aphonia. The sputum was thick, tenacious, yellow-greenish, and streaked with blood. Smears were made frequently and stained for tubercle bacilli, but always with negative results. Cultures from this sputum revealed

* Read in the Section on Pathology and Physiology of the American Medical Association, at the Sixty-Fourth Annual Session held at Minneapolis, June, 1913.

1. Breed, Lorena M.: Some Clinical and Experimental Observations with a Saccharomyces, Arch. Int. Med., August, 1912, p. 108, abstr., THE JOURNAL A. M. A., Sept. 7, 1912, p. 825.

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a pure growth of the saccharomyces. The von Pirquet tuberculin test was negative. A skin-test with the yeast extract was slightly positive, and the patient's serum agglutinated the organisms in a dilution of 1:40. The blood examination showed hemoglobin, 60 per cent.; erythrocytes, 4,576,000; leukocytes impossible to count because of the amount of yeast-cells; small mononuclears, 32 per cent.; large mononuclears, 5 per cent.; polynuclear neutrophils, 60 per cent., and polynuclear eosinophils, 3 per cent. The patient made some improvement, and, December 9, went to Los Angeles where she had a relapse and died Jan. 12, 1913.

On account of the distance from Pomona, some time elapsed before permission was obtained for a partial examination of the lungs. This occurred twenty-four hours after death, and after the body had been partially prepared by the undertaker. On opening the thorax the heart was found to be greatly distended, but no account was made of that, as it was found to contain principally a clear fluid. The pleural cavity on the left side was completely obliterated by adhesions. Posteriorly and laterally and especially about the apex, these adhesions were so firm as to require a knife to separate them. Anteriorly, they were more recent and easily broken with the fingers. The left lung was firm, grayish-purple and consolidated throughout. It showed recent adhesions anteriorly and old adhesions posteriorly. The cut surface presented a solid, grayish-purple granular mass, from which exuded at various points a purulent fluid. There was a good deal of fibrous tissue and there were numerous small abscesses, but no cavity formations. Pieces of tissue from various parts of this lung were taken for microscopic sections. Several capillary pipets were filled with the purulent fluid for bacteriologic examination. The right lung in the upper lobe was practically normal. The lower lobe showed pneumonic spots. Cultures from the purulent material, saved in the pipets, revealed the saccharomyces, mixed with *Staphylococcus albus*. Smears also showed these organisms. Microscopic examination of sections from the lung-tissue revealed a good deal of new and old fibrous tissue with areas of infiltration, which consisted principally of polynuclear leukocytes. Other sections showed small areas of distinguishable lung-tissue with the air-spaces containing broken-down white and red blood-cells. In these areas there was great congestion of the blood-vessels. In many sections of the lung-tissue, minute abscesses could be recognized.

The fixatives used were alcohol and Zenker's fluid. Hematoxylin and eosin, eosin and methylene blue, and acid fuchsin were the stains used at first. After searching many sections in vain for the organisms in the tissue which I had found in the pus, I finally tried the nuclear stain (Janssen's and Leblanc's modification of Moeller's method[2]) which I had previously used for differentiating the saccharomyces in smears from pus and sputum. With this, I was able to detect a few of the organisms among the broken-down leukocytes in the tiny abscesses.

CASE 2.—Miss M. W., aged 16, referred by Dr. Swindt, has always had frequent attacks of "cold" with persistent cough. She has grown very rapidly, at 15 weighing 140 pounds and measuring 5 feet 11 inches in height. She has always been greatly troubled with acne. The family history is very good. Nov. 2, 1912, the patient had an attack of rhinitis and pharyngitis. November 3, a pleurisy developed on the right side. November 4, there was a definite lobar pneumonia of the right lung, which soon involved both lungs. The temperature was 103 and the pulse 130. From November 5 to November 13 she had the usual course of a sharp pneumonia. November 14, an effusion was noted in the right pleural cavity. November 16, 1,000 c.c. of seropurulent fluid was aspirated. November 20, 1,500 c.c. of the fluid was removed and 6 ounces of a 2 per cent. dilution of liquor formaldehydi in glycerol (glycerin) was injected. November 26, this was repeated. December 2, 750 c.c. of the fluid was removed and 8 ounces of the 2 per cent. dilution of liquor formaldehydi in glycerol injected. December 18, thoracotomy was performed, 66 c.c. of the purulent fluid was removed, and a drainage-tube inserted.

Feb. 15, 1913, the wound was closed, the lung well expanded and the cough ceased. March 19, the cough reappeared, following a slight attack of cold, and for a day or two the sputum was profusely stained with blood. During the illness, frequent examinations of the sputum were made for tubercle bacilli. The results were negative. Cultures from the sputum were made early in November, and at intervals throughout the illness and always revealed a vigorous growth of the yeast organism, occasionally mixed with a slight growth of *Staphylococcus albus*. Bacteriologic examination of the pleural fluid was negative. Blood examination late in the illness showed hemoglobin, 70 per cent.; erythrocytes, 3,568,000; leukocytes, 6,000; small mononuclears, 37 per cent.; large mononuclears, 14 per cent.; polynuclear neutrophils, 44 per cent., and polynuclear eosinophils, 5 per cent. This patient was treated with sodium iodid from Nov. 20, 1912, to Feb. 15, 1913. As the acne from the iodids became very troublesome, it was necessary to use considerable Fowler's solution to control it. Aside from this no other medication was used. During the illness the patient lost over 50 pounds. April 22, 1913, five months after the initial symptoms, temperature was normal and the patient had no cough, had gained 7 pounds and had a ravenous appetite. May 27, the blood examination showed hemoglobin, 75 per cent.; erythrocytes, 5,025,000; leukocytes, 7,600; small mononuclears, 15 per cent.; large mononuclears, 12 per cent.; polynuclear neutrophils, 68 per cent., and polynuclear eosinophils, 5 per cent. She had gained 16 pounds.

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2. The technic is given in Kloecker's Fermentation Organisms.

ABSTRACT OF DISCUSSION

DR. A. L. GROVER, Iowa City, Iowa: Has Dr. Breed made any attempt to classify these organisms? We have had our attention called to the question of this infection by an ordinary case of skin infection, which, so far as I can tell, is the same as has been described a good many times, but we have also had a couple of abscesses in the throat which yielded pure cultures. One seemed to resemble more the wild yeast than the cultivated one. One gave a black culture in the ordinary mediums and the other red. In both cases the organisms were in pure cultures and the cultures were sent in by physicians in different parts of the state with the idea that diphtheria was present. The history in the two cases was practically the same, that antitoxin did no good, etc. We have been doing some work along this line in connection with the botanical department and we find from what the professor of botany tells us, Professor Shimek, that we have several varieties of organisms. Some of these should be classified with saccharomycetes and some of them should be classified somewhere else. I do not remember now the exact place, but his reason was that some of them had the terminal arrangement of spores and some of them had the ordinary budding arrangement and he seemed to think we had several different forms of organisms.

DR. LORENA M. BREED, Pomona, Cal.: I should like to say that, so far as classification is concerned, I think a new classification has been proposed by the French of pathogenic yeasts as a whole, but this particular organism has been identified as a saccharomycete. It is a true yeast. I have never grown these from spores, but I think that I can produce spores by withdrawing the nutriment. I shall do this probably in later investigations. I have some reprints of the work which I did last year, which give a review of the literature and of a number of cases, not only in my own work but in the work of other persons, in which these organisms had been found in tonsil membranes as well as in sputum. In two cases in the literature and one case of my own, a diagnosis of diphtheria had been made and antitoxin had been given, with no improvement, and later inturbation was performed and a pure culture of the saccharomycete was obtained from the tonsil membrane.

SYMPTOMATOLOGY OF MULTIPLE SCLEROSIS *

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Patient.—Mrs. F., aged 43, married twenty-two years, housekeeper, was seen in consultation with Dr. M. Barker. The father, aged 70, in fine health, does not drink, uses tobacco moderately and never had any severe, prolonged disease. The mother died of consumption when patient was an infant. Brothers and sisters are all healthy. Patient has five well-developed children; never had a miscarriage.

History.—The patient's birth was natural and she never had convulsions. Childhood was quite uneventful. School life was normal. Menstruation began early and still occurs regularly and painlessly, though rather profusely. The patient was well till fourteen years ago when she experienced an attack of paralysis, first on the left and then on the right side. She remembers a distinct tingling sensation traveling up the legs and arms. No disturbance of consciousness occurred with this attack of paralysis. There was some difficulty in controlling the bowels and she thinks she had some trouble retaining the urine. All this lasted about ten days, after which she seemed to recover except for the left hemiplegia which disappeared only in part. Some months after this the right side became gradually paretic again, but was never so bad as the left. The patient's mentality being somewhat below par, her laughter at times being most impulsive and immoderate and her husband not remembering well his wife's earlier condition, it was not possible to learn more of the patient's history.

Examination.—The gait was typically that of a mildly spastic paraplegia. The knee-jerks were highly exaggerated, and all of the usual symptoms of pyramidal involvement, such as the ankle-clonus, the Babinski, Gordon, Oppenheim and Chaddock signs were all easily demonstrated. The abdominal reflex was absent. Incoordination and intention tremor were most obvious in the hand and arm movements. Tactile sensations seemed to be well preserved everywhere except in and about the right hypogastrium. No analgesia could be detected and the thermic sense was only now and then slightly confused. Nystagmus, particularly on extreme lateral tension to the left, was marked. Only the slightest degree of speech disturbance could be detected.

An examination of the eyes proved negative except for a slight temporal pallor of the disks. At times there was a little difficulty in swallowing and a sense of choking. The mentality was hysteroid in character, and impulsive and immoderate laughing occurred. A Wassermann blood-test proved to be negative. Diagnosis: Typical disseminated sclerosis.

It is not my purpose to describe, or even to enumerate, all the symptoms that have been credited to multiple sclerosis. Last year,[1] I attempted to define sharply the pathology of the disease in order to distinguish it from a mere disseminated encephalomyelitis and thus to account for the wide diversity of opinion among equally competent authorities as to the frequency of multiple sclerosis. It is my desire to attempt the same thing this year in connection with the symptomatology.

It is an easy matter to diagnose multiple sclerosis clinically when the Charcot triad of symptoms is present. Nosology long ago determined that when the so-called intentional tremor, nystagmus and scanning speech, with some evidence of more or less involvement of the pyramidal tracts were present the case should be acknowledged as one of insular sclerosis. Such clear-cut cases, however, as every clinician must admit, are exceedingly rare. Even cases in which one or two of these cardinal symptoms are characteristically pronounced are rare enough. Therefore those conservative diagnosticians who hold rigidly to the Charcot picture of the disease will find their list of cases small, and their view will be that multiple sclerosis is an exceedingly uncommon affection. In this view they will receive some support from the fact that occasionally these cardinal symptoms have been observed in cases which on necropsy proved to be entirely different maladies, as for example the pseudosclerosis and diffuse scleroses, malarial intoxication, cerebrospinal syphilis, and dementia paralytica.

The query here forcibly intrudes itself, What are we to do, go on making erroneous diagnoses in calling all sorts of maladies insular sclerosis because forsooth they happen to present a nystagmus with a spastic gait, a disturbed speech or a peculiar tremor; or are we to limit our diagnosis of insular sclerosis to the strict Charcot picture and call all the others that merely suggest a disseminated lesion by some other name; or admit, if in the last instance no other name than multiple sclerosis can be applied, that no positive diagnosis is possible? As it seems to me, this is the clinical problem to-day in regard to multiple sclerosis; and until some agreement is obtained in regard to these questions, all further discussion of the frequency of the disease, based on clinical statistics, is a waste of time and energy. In a word, the literature of multiple sclerosis to-day declares as plainly as language can that every diagnosis of multiple sclerosis, in the absence of the typical Charcot picture, is but a guess, and here as well as in the cases that present a modified or atypical Charcot picture the positive diagnosis can be made only at the post-mortem table.

That the foregoing criticism is not unduly harsh, let me illustrate by the following report of a case from a well-known clinician, typical of the literature of multiple sclerosis:

> The patient, a girl aged 19, after a week's sickness vomited, had pains in the abdomen and was unable to walk. She was bright and cheerful and the first diagnosis was that of hysteria. In a few days the incontinence of urine and feces awakened the suspicion of an organic basis for the symptoms. Finally the diagnosis of disseminated sclerosis was made on the following summary of symptoms (here I quote from a prominent medical journal of London):
>
> 1. Patient in bed, fairly cheerful, but disinclined to speak.
> 2. Inability to stand, although both legs are moved freely in bed.
> 3. Reflexes exaggerated, no tremor, and apparently no anesthesia.
> 4. Dilatation of the left pupil, with left ptosis, and flattening of the left side of face.
> 5. Incontinence of urine and feces.
> 6. Occasional purposeless vomiting; apparently no headache.

The diagnosis vibrated between cerebral tumor in a silent area, tuberculous meningitis and disseminated sclerosis. It finally settled on the last-named, though why I do not see. The reporter held that this diagnosis was established at necropsy, when on "minute examination of the hardened brain" there appeared "numerous areas of degeneration throughout, their shape, size and distribution being very irregular. There was no shrinking or bulging of the cord at the sites of the degenerative areas."

All of these symptoms and pathologic findings fail, in my judgment, to establish the diagnosis of multiple sclerosis. A general infective process with a dissemin-

* Read in the Section on Nervous and Mental Diseases of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

1. Mettler, L. Harrison: Multiple Sclerosis, THE JOURNAL A. M. A., Nov. 2, 1912, p. 1607.

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ated lesion does not necessarily mean multiple sclerosis. No wonder some men find the malady so common while others find it so rare!

The danger of calling every case of encephalomyelitis, the lesion of which happens to be disseminated, multiple sclerosis lies in the fact that many forms of curable disease will be regarded as progressive and hopeless. Not a few of the infections of the nervous system reveal a scattered condition of the lesion, and if such a pathologic condition should happen to exhibit a clinical picture so strongly similar to that of multiple sclerosis as to lead to the latter diagnosis, the real nature and possible curability of the disease are bound to be overlooked. Even more emphatically will this be the case if we cut loose entirely from the classical symptomatology of the disease and call cases of disseminated sclerosis those which do not present the tremor, nystagmus, speech scansion or spastic condition of the limbs.

Clinically the problem narrows itself to the question as to whether the classical picture of Charcot is to be regarded as a mere syndrome, a localization picture only, or as a sign of a distinct disease entity. If the former, then it would be better to drop the term "multiple sclerosis" entirely since we have come to regard that as a progressive malady and incurable, and to emphasize in our diagnosis merely the infectious process underlying the particular case in hand and the disseminated character of its lesion.

If the latter view is to prevail, then it would be wiser to adhere strictly to the Charcot picture of multiple sclerosis and to endeavor to differentiate its symptomatology from that of a mere disseminated encephalomyelitis of infectious origin. To illustrate: It would be better to make the diagnosis dementia paralytica, though its symptoms may in some respect resemble those of multiple sclerosis, than to establish the diagnosis of the latter, as has not infrequently been done and long after, even after death, discover that the malady was syphilis of the central nervous system with, in the case in hand, a more or less disseminated lesion. In other words, there is a practical advantage, and even safety, in clinging more rigidly than has been the tendency of late to the older and more strict definition of multiple sclerosis. The farther we drift away from that anchorage the wider will the sea of confusion become and the larger will the number be of erroneous diagnoses.

To accomplish the result which I have just indicated, namely, the more accurate diagnosis of genuine multiple sclerosis, two things will be attempted, admittedly difficult as they are. First, the positive and characteristic symptomatology of typical multiple sclerosis, so far as the cases that have been verified by necropsy warrant it, will be outlined; and secondly, the symptomatology of a mere disseminated encephalomyelitis, with whatever shades of difference there may be between it and the previously indicated symptomatology of multiple sclerosis, will be described.

Of course no one symptom will establish the diagnosis of any disease. Two or more, if one includes a cardinal symptom, may. The positiveness of the diagnosis increases with the number of cardinal symptoms included in the general picture. In multiple sclerosis, of the Charcot type, perhaps the two most distinctive symptoms are optic atrophy and more or less spastic paraplegia with its usual accompaniments in the way of heightened knee-jerks, Babinski phenomena, clonus, etc. Next in importance, and of course when added to these confirming the diagnosis almost absolutely, is the tremor, whether it be manifested as an intention tremor in the hands, a scanning in the speech or a nystagmoid movement in the eyeballs.

All of these symptoms are so well known that I shall not presume to waste time describing them. I desire in naming them in this order merely to point out that after leaving this group of manifestations we have absolutely nothing whereon to base a positive diagnosis of multiple sclerosis or any form of the disease. With one or more of these distinctive manifestations are often seen a whole host of other symptoms, psychologic and physiologic, which may suggest the diagnosis of multiple sclerosis but which in a goodly number of cases will be found to belong to some other malady with a disseminated lesion. It is just at this point that the erroneous diagnosis of multiple sclerosis is so often made, as shown by post-mortem examination. It is a risky business to diagnose multiple sclerosis on these non-cardinal symptoms when one has in the picture only one of the cardinal signs. It is nothing but a gratuitous guess and no diagnosis at all to call the case one of multiple sclerosis when the signs present include all of the non-cardinal signs but not one of the typical manifestations. Nevertheless, a survey of the literature of multiple sclerosis shows that just that sort of diagnoses are being made every day. The uncertainty and inaccuracy of these diagnoses obviously render such literature quite worthless for scientific purposes. Among the non-cardinal symptoms, by way of illustration, I may enumerate the slight mental changes, the fugitive pains, slight paresthesias and other variable sensory disturbances, the apoplectic and epileptiform seizures, the bladder and bowel irregularities, the pupillary inequalities and the bulbar manifestations. All of these symptoms appear more frequently in other maladies than in multiple sclerosis. In the latter they are incidental rather than diagnostic.

Peterson names six cardinal symptoms of multiple sclerosis: muscular weakness sometimes with cranial palsies, intention tremor, exaggeration of the knee-jerks and wrist-jerks with possibly jaw-jerk and ankle-clonus, nystagmus, speech disorder and various signs of nervous disturbance such as vertigo, headache and epileptiform and apoplectiform seizures with mental dulness. With the exception of the last-named group, this list corresponds with the cardinal symptoms which I have already enumerated. The last group, or various signs of nervous disturbance, is not distinctive of any special nervous malady but occurs more or less in all. Therefore I cannot see how they are cardinal in multiple sclerosis or help us *per se* in diagnosing this disease. In fact the same is true of the muscular weakness, the general spastic paraplegic signs and the nystagmus. All of these occur frequently in other troubles. If anything is characteristic about them when they appear in disseminated sclerosis, it is the fact that they never go on to completion. The muscular weakness never becomes actual paralysis. The nystagmus is never so typical as in labyrinthine disease. The exaggeration of the reflexes is never of the highest degree, as seen in lateral sclerosis of the cord. It is this incompleteness of the manifestations that is the cardinal feature of the disease rather than the manifestations themselves. This leaves, therefore, as the characteristic symptoms of disseminated sclerosis, only the peculiar optic atrophy, the intention tremor, the speech disorder and the incompleteness of the spastic paraplegia. To these some authorities have added the loss of the abdominal reflex, though the uniformity of this has not been such, in my judgment, as to dignify it with the adjective cardinal.

It is on the cardinal symptoms that multiple sclerosis assumes a definite nosologic status. Without one or more of the cardinal symptoms, multiple sclerosis as such cannot be recognized clinically. A curious problem obtrudes itself at this point. How are we to explain such a uniformity of symptomatology with such a wide-spread and haphazard lesion as multiple sclerosis presents? Why, with such a lesion, are the motor manifestations so frequent, so uniform and so distinctive, while the sensory are so indefinite and insignificant? Why are the vision and the optic nerve so often affected while the smell, taste and hearing are so rarely involved? How does it happen that such a scattered and haphazard lesion produces such pronounced external phenomena and yet such relatively slight visceral disturbance? And finally, why are some of the symptoms so permanent while others, though almost cardinal, are so transitory? Can it be that pathologically multiple sclerosis is one thing, namely, a wide-spread lesion, but clinically is quite another thing, a mere localization syndrome representing a part of the lesion?

In some respects it looks as if our classical conception of multiple sclerosis were limited to the disturbance of the apparatus of equilibrium and coordination. This is suggested by the cerebellospastic gait, the nystagmus, the speech scansion and the intention tremor. Cases of disseminated myelitis, involving the cord, medulla, pons and brain are not entirely unlike multiple sclerosis in their symptomatology, but there are usually other symptoms that help one to differentiate the former from the latter. There is a slightly different etiology between the two diseases as, for instance, the presence of a more or less neuropathic heredity in the sclerosis. On careful and prolonged observation the age at which multiple sclerosis is prone to appear, the sharper and more fixed character of its essential symptomatology, its general course and whole complexion are somewhat different from that of disseminated myelitis. The differentiation is difficult—extremely difficult—but it is not impossible. In the broadest view disseminated myelitis has many features about it that do not appear in multiple sclerosis. When, however, the myelitic lesions happen to entrench on and involve the functions of the general apparatus of equilibration, then its features may assume the characteristics of those of multiple sclerosis.

Disseminated myelitis is characterized by extensive paralyses with atrophy and disturbances of sensation, even more so than is ordinary transverse myelitis. In both they are decidedly more marked than they are in disseminated sclerosis. In the case of disseminated myelitis reported by Taylor and quoted by Starr, there were pains, incontinence of urine, marked weakness and numbness, and finally paralysis of the legs. There were high temperature, dyspnea, complete paraplegia, cystitis, retention of urine and tympanitic and resistive abdomen.

The point is that if we add the symptomatology of a disseminated encephalitis to the symptomatology of disseminated myelitis, even though, as Starr says, "disseminated encephalitis of infectious origin is the starting-point of many cases of so-called multiple sclerosis," we never find exactly the characteristic picture that we do in this so-called multiple sclerosis. There must be some element that marks the two sets of lesions one from the other. In the etiology there are the more marked hereditary and neuropathic preliminaries to the outbreak of multiple sclerosis; and in the symptomatology is that trait that clearly suggests involvement of the cerebellum or at least the cerebellar general apparatus, and all its connections, that preside over the function of equilibrium and coordination; also the age (early) of multiple sclerosis and the relative absence of syphilis.

Until there is a stronger basis for the view that disseminated encephalomyelitis is the same as disseminated sclerosis, we are justified in holding that the latter disease is a most rare affection, and in discarding from our statistics those reported cases that are called atypical and are yet unverified by a careful and rigid postmortem examination.

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ABSTRACT OF DISCUSSION

DR. C. D. CAMP, Ann Arbor, Mich.: I am surprised that Dr. Mettler did not mention the examination of the spinal fluid. I believe that this examination is important for differentiating multiple sclerosis from some of the conditions which are frequently mistaken for it. I think that Dr. Mettler referred to two cases reported by Dr. William G. Spiller and myself, in which the diagnosis was multiple sclerosis; in fact, the cases had been demonstrated to students as being typical of multiple sclerosis in every respect, but at necropsy they were found to be cases of syphilitic meningomyelitis. The title of this paper was "The Clinical Resemblance of Cerebrospinal Syphilis to Disseminated Sclerosis" (*American Journal of the Medical Sciences*, June, 1907). Such an error would not have occurred at the present day, I am sure, because the examination of the spinal fluid would have shown the correct diagnosis.

DR. JULIUS GRINKER, Chicago: It is true, as Dr. Mettler has stated, that we cannot always clinically differentiate encephalomyelitis from multiple sclerosis. It appears to me, however, that the only way in which we are at present able to diagnose multiple sclerosis is by excluding every other possible condition capable of producing the symptom-complex. When we discover a condition, the result of multiple foci, which is not syphilitic and not due to vascular disease, we have to think of multiple sclerosis regardless of whether or not we have Charcot's triad or any of the other symptoms of insular sclerosis. Noone, in his book on syphilis of the nervous system, says that he is now convinced that he was in error when he believed that multiple sclerosis may give a positive Wassermann reaction. The only other condition that might occasionally give rise to difficulties in differentiation is brain tumor. Not long ago a patient was sent to me who presented symptoms of brain tumor. The patient had Jacksonian fits but no optic neuritis and Babinski sign on one side with only exaggerated reflexes on the other. In the absence of other symptoms, I assumed that the patient had a cortical tumor, something in the nature of a cyst. An operation was performed, but no tumor was found. Instead a large patch of multiple sclerotic tissue was discovered. Several foci together had given rise to the symptoms of a brain tumor. The patient died and multiple sclerotic foci were found in various other parts of the central nervous system. Such errors we seem to have no means of preventing. Otherwise I believe Dr. Mettler's point of view is not tenable, for, if I understand him correctly, he states in substance that because it is often impossible clinically, from the symptoms alone, to diagnose multiple sclerosis we should not diagnose it at all. I believe the disease to be more common than he states, and if we follow the rule of diagnosis by exclusion—by which I mean the seeking out of every possible condition and excluding it definitely, not only clinically, but also by means of all the new laboratory tests—we shall be able, in most cases, to diagnose multiple sclerosis.

DR. D. S. BOOTH, St. Louis: It is only a few months since I had occasion to look up the literature on this subject, on account of a clinical case which came under my care, the result of which was the discovery that atypical cases much resemble several other diseases. The patient was a girl about 15 years old who had probably had symptoms of one kind or another all her life, so that the case brought out very prominently

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the possibility of Friedreich's ataxia. I found in the literature that this condition at times resembles atypical multiple sclerosis. With great difficulty I arrived at a conclusion and, even when I finally decided on a diagnosis of multiple sclerosis, I stated to the medical class before which I presented the case that there was a possibility of an error since I had found that eminent clinicians had erred in differentiating this disease from several other diseases which it may closely simulate.

DR. CHARLES W. HITCHCOCK, Detroit: If I understood Dr. Mettler correctly, he restricts the term "multiple sclerosis" to a quite typical syndrome, and yet he has pointed out adequate reasons from the pathology of the disease why multiple sclerosis should be distinctly atypical. It does not seem to me that we should expect this disease to present typical symptoms and typical development; nor should we shrink from the diagnosis if it be difficult and somewhat uncertain, as we do not shrink from the diagnosis of syphilis of the nervous system. The varying signs of sclerosis, varying from the location and size of the pathologic lesions, would seem to indicate an atypical disease; therefore, I do not see why we should reserve the term "multiple sclerosis" for the typical syndrome if we have in mind the pathology of anything which develops atypically. It is a risky business, perhaps, for me to speak without having had any pathologic proof of some of my diagnoses, but I have had a number of cases, diagnosis of which I have been able to reach by such exclusion methods as Dr. Grinker has mentioned. These cases have been extremely atypical. I recall three in the past year, in each of which I was forced to a diagnosis of multiple sclerosis, but no one of which conformed to any cardinal type of the disease.

DR. L. HARRISON METTLER, Chicago: In reply to Dr. Camp I will confess that for the moment I did forget what everybody nowadays knows, that a cytologic and serologic examination of the spinal fluid will determine the presence of the syphilitic infection. There may be other infections present, however, which such an examination will not aid us in establishing. I agree, in the main, with Drs. Grinker and Hitchcock that multiple sclerosis can be diagnosed by exclusion; yet a diagnosis by exclusion is always largely a makeshift, and, although we are sometimes forced to do this, it is always a most desirable thing to avoid making a diagnosis in this way. Too often multiple sclerosis, like hysteria and neurasthenia, is made a sort of waste-basket into which is thrown everything which by exclusion cannot be diagnosed as some other malady. The literature is full of these uncertain diagnoses of multiple sclerosis, and this is the reason that I have presented this paper on the symptomatology of the disease. These diagnoses by exclusion, of which the literature is so full, are in most cases no diagnoses at all, or at least are so unreliable as to render the reported cases practically worthless in forming statistics as to the frequency of the disease. A frank confession that no diagnosis is possible is usually safer and more scientific than the average diagnosis by exclusion.

Reticence of Physicians Regarding Fee-Division.—"It is evident," observes the *Journal of the Indiana State Medical Association*, "that a large proportion of the general physicians and no small number of surgeons prefer not to discuss the fee-splitting proposition. The reason is obvious. No man who is possessed of good moral fiber will defend fee-splitting as ordinarily practiced, and the man who gives or accepts a commission, which almost invariably is a secret transaction and therefore a species of graft, avoids discussion of the subject. If unwillingly he is forced to express an opinion he eases his conscience by trumping up an argument, based on false premises, concerning his desire to be a party to a 'square deal.' . . . Fee-dividing among medical men always has been and always will be a commercial proposition which has no place among ethical and honorable physicians. It started through covetousness on the part of certain unsuccessful surgeons who desired more business and incidentally more income, and was accepted by certain general physicians, not as their due but as 'easy money.'"

THE REMOTE EFFECTS OF LESIONS OF THE PROSTATE AND DEEP URETHRA *

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To the genito-urinary surgeons we are indebted for the great advance in our knowledge of the nature, frequency and importance of lesions of the prostate and deep urethra. Much of this is important only as regards the local disease, and with this we are not here concerned; but in some cases there are many secondary results important to recognize from the point of view of general medicine. One of the lessons usually driven home more by our own mistakes than by the instruction of others is the recognition of the frequency with which disturbance—organic or functional—in any system or organ is due to derangement elsewhere. The locality of symptoms is not of necessity the seat of disease. The importance of recognizing that gastric disturbance may be caused by chronic disease of the appendix or by gallstones is a good example. It is to some of the disturbances secondary to disease of the prostate and deep urethra that attention is here drawn. There is no intention of encroaching on the domain of the genito-urinary surgeon; the desire is to emphasize the importance to general medicine of the lessons of their work. We have been slow to profit from their advances.

It is perhaps an advantage to divide the disturbances into functional and organic, using the former term in its usual significance. For example, as a result of inflammation of the verumontanum there may be a general nervous disturbance, while secondary to an infection of the prostate—such as with the gonococcus—there may be arthritis. It is convenient to discuss the results of the lesions of the prostate and urethra under the various systems, as this may emphasize the variety and importance of the disturbances.

DISTURBANCES OF THE GENERAL NERVOUS SYSTEM

There is no need of pointing out the importance of a thorough study of every patient with general functional nervous disturbance in order to determine the cause, if this be possible. In these patients experience has taught the necessity of a thorough search in order to exclude the existence somewhere of organic changes before making a diagnosis of neurasthenia. Take for example the necessity of excluding hyperthyroidism. More careful study of patients with general functional disturbance—call it what you wish, neurasthenia or psychasthenia—shows the frequent coexistence of some local disease with the general disturbance. In helping these patients back to health both the local disorder and the general condition require attention, as a rule; sometimes relieving one is enough, but care of both usually gives better results.

Without discussing all the etiologic possibilities of general nervous disturbance, about which there is enough dispute, all that is desired here is to draw attention to the importance of prostatic and urethral lesions as one factor in causing general nervous disturbance in males. Every one used to dread the problem of handling patients with so-called sexual neurasthenia. On many of the profession they have a peculiarly irritating effect and there are few of us who have not had difficulty in keeping our tempers when dealing with them. What has

* Read in the Section on Practice of Medicine of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

more thorough examination of the genito-urinary system of many of these patients taught? In a considerable number the cause—or the determining cause—is found in some local disease, correction of which results in a restoration to proper function and good health. It is not suggested that all such general disturbances in males are due to such local conditions, but certainly many of them are. Careful inquiry regarding and examination of the genito-urinary system should be made in every case of nervous disturbance in the male. Systematic inquiry is often necessary as the usual history may fail to elicit any information on the subject. Why this should be is a question not always easy to answer; probably the explanation lies in the effort to put out of consciousness the thought of disturbances in the sexual sphere. This seems more likely than concealment done purposely.

The account of a case of this kind may aid in showing the results which may follow such local lesions.

History.—The patient, aged 25, a clerk, complained of marked cardiac disturbance and severe gastric trouble. He had had the ordinary diseases of childhood, but no serious illness, and there was no history of cough or shortness of breath. The appetite was good; the bowels were usually constipated and had been so for many years. There was no history of urinary trouble or venereal infection. He had used very little tobacco and had never taken alcohol.

Present Illness.—The trouble dated back over a period of five years. The patient had been worried by constant gastric distress which was most marked for about one hour after each meal. There was no pain or vomiting, but he was greatly troubled by acid eructations. With this he had suffered a great deal from disturbance of the heart-action, which nearly always accompanied the gastric disturbance. There had been marked cardiac palpitation, and at times the heart-action was so violent that he was unable to do any work and would have to lie down for an hour or two. With this his general nervous condition had been much disturbed. His attention was constantly fixed on his heart, and when the action was very forcible he felt much mental disturbance and alarm. He was ambitious and anxious to advance in business, in which he had good prospects if he could keep at work, but these symptoms made him practically useless so far as efficiency was concerned. With these disturbances there was constant apprehension and anxiety. The appearance of a visitor in his office, or any little disturbance, gave him the fear that his heart would be disturbed, and naturally his fears were often verified.

Examination.—The patient was thin, extremely nervous and restless. The pupils were large and the skin reactions were active. The action of the heart was vigorous and at times one would have said that there was a systolic shock at the apex. There was no enlargement and the sounds were clear. There was no arteriosclerosis and the blood-pressure was 115. The pulse-rate varied from 72 when the patient was at rest, to 130 during excitement or gastric disturbance. The reflexes generally were increased. The urine was clear. A test-meal showed marked hyperacidity. The lungs and abdomen showed no abnormality.

Treatment and Course.—The patient spent some weeks in the hospital and with rest and treatment of the hyperacidity showed considerable improvement. He did not seem to gain so much as one would expect, but he was discharged in considerably better condition and with a good gain in weight. He was able to take up his work. After about three months, however, he was back to his previous state and he returned for further examination a year later. In the meantime I had had some lessons in regard to the importance of lesions of the genito-urinary tract and looked into this on the subsequent visit. It was found that the patient had marked inflammation of the verumontanum; this was treated locally with the most remarkable result. He began to improve at once and within a few weeks the whole picture had changed. He had gained weight, the heart symptoms had disappeared and the digestive disturbance occurred only occasionally.

One might quote histories of this sort at considerable length, but they differ only in detail, the important fact being that the general disturbance may be determined, apparently, entirely by the local trouble, the correction of which, with such other measures as are required, results in improvement of the whole individual. This paper is not concerned with a discussion of the cause of the disturbance. In some persons any local trouble may produce an effect apparently out of proportion to the cause. In some a disturbance in the sexual sphere may have a pronounced influence on the whole individual.

In many of these patients a predominant feature is the condition of anxiety for which, on the surface, no cause is found. This is in agreement with the frequent occurrence of anxiety neuroses in disturbances in the sexual sphere. In several patients the symptoms have been referred especially to the heart—palpitation, rapidity of rate, attacks in which with precordial distress there was tachycardia, and attacks of pain simulating angina pectoris, have all been seen. As a rule, severe distress, feelings of apprehension, and marked anxiety accompanied these. A patient, seen recently, came with a diagnosis of angina and a gloomy prognosis; disease both of the prostate and deep urethra was found; local treatment has produced a remarkable effect and he is entirely free from attacks, has gained weight and is able to attend to his business as usual. Naturally general measures, as well as local, were adopted, but the definite diagnosis and a changed prognosis probably had much to do with the rapid improvement.

The recognition of the cause in such cases is essential to proper treatment, for, without this, the patients go from one physician to another, finally perhaps giving up all hope of recovery. A discussion of the relationship between cause and effect in these cases would lead us far afield. Of the close association in many cases between disturbances in the sexual life and general nervous derangement there can be no question. One may ask if it is probable that a man with a perfectly normal nervous system to begin with can be upset nervously by such a local trouble. The definition of what is normal may cause difficulty, but a person normal to all ordinary appearances can be so upset. The results following proper treatment also support the view as to the importance of the local lesion, and when one sees rapid restoration to good health after correction of the local trouble it is difficult not to feel that this, at any rate, played a large part. In some of the cases with a tendency to general nervous disturbance and some local trouble it seems as if the latter condition is enough to disturb the balance. Correct it and the whole individual may be restored to health. Whether or not those who are thus upset deserve the description of normal may be a question, but it is one which does not concern us here.

REFERRED PAINS

In the whole study of pain we have constantly to be on our guard not to be misled in diagnosis by the seat of the pain complained of by the patient. This applies particularly to pain referred to the legs because there are so many possible causes for it, and it is too often and too easily dismissed with a diagnosis of sciatica or "rheumatism." It is important to recognize that with disease of the prostate or deep urethra there may be referred pains in many localities. The great variety of these is well brought out by Young, Geraghty and Ste-

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vens[1] in a discussion of chronic prostatitis. A large proportion of their patients had pain in the lower back which is easily called "lumbago"; in others it was referred to the region of the kidney and, particularly important, in some cases it simulated the pain of renal colic so closely that a diagnosis of renal calculus had been made and the patients referred to Dr. Young for operation. Three patients had been operated on for a supposed renal calculus. A number of patients had pains referred to the groin, perineum, rectum and testicles. In some it was referred to the legs, in some to the thigh, in others to the knee; in several it had been regarded as sciatica. In others there were disagreeable sensations referred to the rectum, perineum and genital organs.

There are many regions to which these pains may be referred, but of special medical importance are those of the abdomen, the back, the kidney, the perineal and anal regions, and down the legs. Pain referred to the perineum or genitalia suggests some local trouble. It is with those referred elsewhere that error may arise. There is no regularity in their distribution; they may choose any location. Complaint is sometimes made of pain over the great trochanter on one or both sides, and this may have continued for a long time. In some cases the pain is referred to the back or to the sacro-iliac joint, and a hasty judgment may decide on disease of the vertebrae or sacro-iliac joint as the cause. The pain is often referred to the thighs, sometimes on the inner side, sometimes on the outer part and sometimes along the course of the sciatic nerve. A detailed discussion of these referred pains is not possible here. In the abdomen, renal colic or intestinal colic may be simulated. One patient complained of very severe attacks of abdominal pain which came on irregularly, were very severe and prevented his working for some hours. Dr. Randall saw him with me and made an examination of the deep urethra. The patient did not know that there might be any association between the condition in the urethra and the attacks of pain. When the verumontanum was touched the patient cried out and said that an attack of colic was coming on. There was no doubt of the severity of the attack. He writhed with pain, his face became pale, he broke into a profuse sweat, the pulse could hardly be felt at the wrist, and he almost went into collapse. This agreed with the description of the attacks which he had given before and which I had thought he was exaggerating. With this there was hardly any pain felt in the urethra or bladder.

One referred disturbance of sensation—for it is hardly a pain—is of especial importance in lesions of the verumontanum, namely, pruritus ani. It is surprising how frequently patients make complaint of this, and, if the usual causes are not found, the possibility of disturbance in the deep urethra should be considered. Another disturbance of sensation may be referred to the rectum. There is a feeling of discomfort at a point a short distance above the sphincter. Sometimes the patient has the sensation of feces being in the rectum when it was empty. There may be no complaint by the patient of any pain in the diseased area or of symptoms referred to it.

CHRONIC ARTHRITIS

One of the lessons slowly being learned is that chronic arthritis, excepting gout, is in the majority of cases due to some infectious process, and in our search for the focus of infection the prostate must not be forgotten. In some cases this is a gonococcus infection with a resulting gonorrheal arthritis, in which connection it must be remembered that a negative examination of the urethra alone is not enough to exclude a gonococcus infection, and the prostate should also be examined. Apart from this particular organism we must recognize that the ordinary prostatitis may be the focus responsible for an arthritis, and the recognition of this may enable us to materially benefit the joint-disease. Of somewhat similar nature may be the chronic nephritis found in some cases in which a cause is difficult to find. This perhaps is due to a slow chronic infection in some cases, and the prostate may be the source of the organisms or toxins.

I have an impression, and one should always be very cautious in basing any inferences on impressions, that arthritis of the spine—spondylitis—occurs in a relatively large number of cases secondary to prostatitis. In several cases a gonorrheal arthritis of the spine seemed undoubtedly due to a chronic prostatic infection. The combination of the two conditions—spondylitis and prostatitis—may lead to error, as the referred pains due to each condition may be much alike. If one recognizes the spondylitis it is easy to consider that it may be responsible for the symptoms, rest content with this, and so miss the cause behind the spondylitis.

The proof of the association of arthritis and prostatitis is not always easy of demonstration. If the prostate is the only possible source of infection, this is a suggestive point. In some cases the proof is strongly supported by treatment of the prostatic condition resulting in improvement of the arthritis.

RENAL CONDITIONS

The effect of prostatic disease on the function of the kidneys may be marked. This is seen strikingly in cases in which there is marked obstruction from an enlarged prostate. There may be albumin and casts in the urine due not so much to actual renal disease as to irritation and perhaps back pressure. One important bearing of this is on the decision as to the wisdom of operation for the prostatic hypertrophy. The kidney condition may be regarded as of much more serious importance than it really is and operation be avoided when it is particularly required to improve the renal function. In this connection the functional test by phenolsulphonephthalein is most valuable in giving us correct information as to the renal condition. In some cases the problem is largely a mechanical one, but there is no doubt of its being more than this in other cases. The marked improvement in renal function after operation in certain cases in which there was little or no mechanical obstruction is proof of this.

CIRCULATORY SYSTEM

The influence of disease of the prostate on the myocardium and through it on the circulation is one which interests both the physician and the surgeon, especially in making a decision as to the safety of operation. There are a number of factors which have to be taken into account, such as an infection of the prostate and possibly of the bladder, sometimes pyelitis, and probably renal disturbance of some degree. Many of the patients are advanced in years and so have a certain amount of arteriosclerosis and myocardial change. This question has interested me greatly in recent years as I have seen many of Dr. Hugh Young's patients in consultation to discuss the question as to whether or not it was safe to operate. In many of these cases the question arose on account of the circulatory condition. A striking feature in such

1. Young, Geraghty and Stevens: Johns Hopkins Hosp. Rep., 1906, xiii, 313.

cases has been the frequency of signs of myocardial disease, an increased heart-rate, irregularity, and not infrequently dilatation. Hypertrophy is present in a considerable number of these patients as a matter of course. Many of them are advanced in years, have arteriosclerosis, suffer from chronic bronchitis, and altogether cannot be regarded as good risks. In such patients every effort must be made by careful preparation to lessen the risks of anesthesia and operation. What has impressed me particularly has been the striking change in the cardiac condition in many of them very soon after operation. This was not the result of treatment after operation directed to the cardiac condition. The operation itself might be expected to prove a heavy strain on these senile hearts, but as a rule it was quite the contrary. In some cases improved renal function undoubtedly had some influence, but the rapid improvement suggested more than this. We are aware that Dr. Babcock of Chicago has drawn attention to the influence of gall-bladder disease in the production of myocardial changes, and it is possible that prostatic disease may have the same effect. At any rate, it is important to recognize its importance in affecting the heart and not to attach too much weight to cardiac disturbance in deciding as to the wisdom of operation. The removal of the prostate seemed in many cases to be followed by an immediate change for the better in the cardiac condition; but this should not lead to the taking of undue risks in advising operation.

Reference has been made to various disturbances of the heart which may be regarded as functional in character. The occurrence of attacks of pain, which may simulate angina pectoris, and of vasomotor phenomena should be kept in mind. It is probable that these result from general nervous derangement. One circulatory condition which is rare but apparently does occur secondary to prostatic infection is phlebitis. This may be in adjacent veins or in distant parts. This possibility should be kept in mind in obscure cases of phlebitis in males.

NERVOUS SYSTEM

The general functional disturbances secondary to these local lesions have been noted, but attention may be called to another point of association in regard to some organic diseases of the nervous system. Certain of these may cause disturbance of the function of the bladder as an early evidence of their presence. Thus precipitate urination may be an early sign of multiple sclerosis; it may also occur in some patients with an inflamed verumontanum. In locomotor ataxia disturbance of bladder control is common, and patients with this condition may consult a genito-urinary surgeon by whom, in not a few cases, the diagnosis is made from the local condition. In this group the tendency is rather to ascribe local symptoms to local conditions than to recognize the general disease. It is important to keep the possibility in mind.

CONCLUSIONS

The frequency with which lesions of the prostate and deep urethra are responsible for symptoms elsewhere suggests the necessity of more frequent routine examination of this region. Careful inquiry into the history should bring out functional derangements; examination should disclose organic disease. Disturbed conditions of the verumontanum are often suggested by the history, while the recognition of disease of the prostate is as a rule not difficult. In any event, if there is doubt, it is advisable to have a more expert opinion. This adds another detail to a systematic examination but one which gives good returns for the effort. It requires no emphasis to show that the recognition of the cause is important for proper therapy.

The question of diagnosis of the local lesions is not discussed here, the intention being to direct attention to the importance of the recognition of lesions in this region. This cannot be overestimated in the study of males with functional nervous disturbances. The tendency to conceal any disturbance in the sexual sphere must always be remembered. The symptoms of prostatic disease have been divided by Young into (*a*) the sexual, (*b*) the urinary and (*c*) the referred. If either or both of the first two are presented, attention is directed to the genito-urinary tract and the diagnosis is suggested. These features are not here discussed. It is in the third group that difficulty arises, and emphasis may be placed on the fact that nothing may be brought out in the history or urinary examination to suggest the presence of the local disease.

The question of treatment hardly comes in this place. Perhaps one warning should be given, and that is against treatment in a haphazard way or by one who has not been properly instructed. Too vigorous or too frequent treatment of the prostate may result in great harm and corresponding disappointment to both the patient and the physician. This is particularly the case in patients with general nervous disturbance, in whom treatment must be conducted with judgment and caution.

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ABSTRACT OF DISCUSSION

Dr. Hugh H. Young, Baltimore: Foreign writers have put the percentage of chronic urethritis in males as high as 80 per cent., which, if true, would show how prevalent deep-seated urethritis and its usual accompaniments, prostatitis and vesiculitis are, and the relative frequency of the remote and referred conditions which Dr. McCrae has mentioned. I think the percentage is not so high in America, but a fairly large percentage of male adults have chronic inflammation of the prostate, often not of the dangerous type, with no local symptoms, no obstruction to urination, no irritation, no sexual disturbance, and yet, in after years, the patient will suddenly begin to have arthritic conditions, or local or referred pains, with no symptoms pointing directly to the prostate, but which are entirely dependent on it. An interesting communication by Head of Edinburgh brought out an explanation of these referred pains. He showed that visceral lesions send painful stimuli to the part of the spinal cord supplying that region, and that from there they may be referred to some other part of the body which is supplied by the same segment of the spinal cord. The prostate thus communicates with a large part of the body below the diaphragm. A rather common neurologic symptom occurring with the prostatic condition is burning or irritation of the soles of the feet. A great many cases of supposed lumbago or sciatica and pains in the groin are undoubtedly simply referred pains from prostatitis. I have seen at least twenty-five cases diagnosed as renal calculus, some with the most typical symptoms, which were due solely to chronic, inflammatory infiltration in and around the prostate and seminal vesicles. The hemorrhage was caused by a greatly inflamed and congested verumontanum, which is often present in conjunction with the prostatitis. At least ten of these patients had been previously operated on for renal calculus, without finding a calculus, and most of them were ultimately cured by massage of the prostate and vesicles, with other local treatment. Agonizing pain in the back, often incapacitating the patient and even confining him to bed or necessitating the use of crutches, may be due to prostatitis. I have seen several patients come to the hospital on crutches, whose whole trouble was due to prostatitis with referred pains in the lower back, hips and thighs. A symptom almost pathognomonic of a diseased verumon-

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tanum is pain in the suprapubic region. General practitioners have for a long time recognized that pelvic inflammatory lesions in women produce a wide range of referred pains, but there has not been a realization in the past that an even greater number of referred pains come from diseases in the male pelvis.

DR. WALTER BIERRING, Des Moines, Iowa: An instance of rather unusual results following a local infective focus in the prostate recently came to my attention. A traveling salesman sustained a rather simple injury, a blow on the thigh, after which the following sequence of changes occurred: He developed a typical femoral phlebitis of the left leg, followed by a local abscess formation, which was incised and the exudate permitted to drain. Three or four weeks of general septicemia followed and then death. There was a claim for accident insurance because of the local injury. At the necropsy a deep-seated abscess of the prostate, showing diplococci, was revealed. In addition, another interesting fact which was brought out by Dr. McCrae was a marked fibrosis of the myocardium, which also could probably be attributed to this latent prostatic infection. There had been a Neisserian infection five years before.

DR. W. O. BRIDGES, Omaha, Neb.: One effect of disturbance of the prostate, which may be overlooked, has come under my observation within the last three or four years, with reference to several cases of abdominal tumor, dependent on obstruction of the prostate. The patient voided his urine apparently to his own satisfaction, but the residual urine eventually caused a tumor, which finally became distinctly palpable. I did not use the catheter, on the ground that the patient was able to pass 8 ounces of urine, in my presence, without any effect on the tumor of the abdomen. Two or three days later, a catheter was passed and the tumor entirely disappeared. When a catheter is passed into the prostate, in cases in which sufficient accumulation in the bladder has occurred to produce a good-sized tumor, it is surprising how much urine can be withdrawn without having much effect on the bladder. The reason is that for several weeks, or perhaps several months, the tumor has resulted in such back pressure of the urine in the kidneys that the urine drained down in the bladder about as fast as it was removed, up to a certain point. This is probably the reason for our failure in many of these cases. I recall one case in which the patient had a tumor for four months, and operation was recommended. He finally went to the hospital, the diagnosis of prostatic obstruction was made and the entire tumor was removed by the use of the catheter.

DR. J. M. ANDERS, Philadelphia: Dr. McCrae has called attention to certain causes of neurasthenic conditions that have been, to say the least, neglected by general practitioners in the past. He has well said that a most careful history is an important matter in the study of these cases. I have learned from experience one fact to which I wish to call attention, namely, that, in the absence of symptoms referable to these organs and in the absence of the history of a gonococcus infection, it will not do for the internist to exclude diseases of the prostate and deep urethra as a cause of neurasthenic states. The specialist knows that either arthritis or prostatitis may be caused by other organisms than the gonococcus, for example, *Streptococcus pyogenes*, *Staphylococcus pyogenes, aureus, albus* and *Bacillus coli communis* and others. The absence of a history of specific or gonococcus infection of the urethra is not proof positive that lesions do not exist which may cause, as I know from experience, reflex symptoms, particularly referred pains in the back.

Plague Universally Endemic.—The disease [plague] is endemic on every continent in the world and in practically all countries, excepting, possibly, those of continental Europe. In our own country any laxity of sanitary surveillance of the endemic centers on the Pacific coast would result in the broadcast spread of the disease. The same will apply to all endemic centers. It is a question of eternal vigilance.—R. H. Creel, *Pub. Health Rep.*

SOME NERVOUS SYMPTOMS OF PERNICIOUS ANEMIA *

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About seventeen years ago my attention was especially attracted to the distinctiveness of the nervous symptoms occurring in pernicious anemia, and at that time I reported a case before the American Neurological Association in which the pathologic findings were those of a subacute combined degeneration of the spinal cord. At this time I called attention to the fact that the sclerosis was apparently vascular, not systemic in origin. Stengel has stated that this type of anemic patients give the highest blood-count. Bramwell in 1910 reported a case in which the nervous symptoms were characteristically those of disseminated sclerosis and in which the cord symptoms developed three years before the anemia became marked, and he emphasizes the fact that the nervous phenomena may occur a long time before the anemia or cachexia which precedes or accompanies the degenerative changes in the spinal cord. This also has been my observation. Not only is the blood-picture not typical of that in pernicious anemia, but the nervous symptoms usually precede for months or sometimes even years the blood-findings characteristic of this disease. In Bramwell's case before mentioned the anemia was so slight that no blood examination was made and it attracted attention and became a feature of the case only a few weeks before death.

Some years ago I saw a patient in whom the clinical syndrome was that of a chronic myelitis; the nervous manifestations overshadowed by more than two years the typical blood-findings of pernicious anemia. Not infrequently the symptoms resemble those of a transverse myelitis or of a multiple peripheral neuritis.

According to Strümpell the nervous symptoms are similar to those of tabes; other writers compare them to ataxic paraplegia. It is an interesting fact that the nervous syndrome may be entirely wanting and yet there may be involvement of the spinal cord. Spiller has shown that the degenerative process may extend into the brain axis.

These symptoms may be purely subjective, such as numbness in the arms and legs. One of my patients complained that the bones were going through the flesh. According to Putnam paresthesias are strikingly noticeable. Knee-jerks may be normal, absent or exaggerated; ankle-clonus and the Babinski reflex may or may not be present; paraplegia may be partial so that the patient may move the legs freely in bed, or it may be complete. Associated usually with this is a loss of control over the bladder and rectum. Lightning pains and objective sensory disturbances are common. Wilson recently reported a case in which gastric crises were present. Dissociation, as in syringomyelia, has been observed. Dimness of vision is quite frequent and occurs early. Optic neuritis, optic atrophy, and hemorrhages associated with retinitis are occasionally seen. Mentality is as a rule unimpaired, although psychotic symptoms have been reported. Camp and others have described cases in which the mental symptoms and signs of paresis were clearly marked.

Dr. Addison, of suprarenal capsule fame, first described (and his description remains classical until

* Read in the Section on Nervous and Mental Diseases of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

to-day) a fatal and apparently causeless anemia which he designated idiopathic anemia, and it was while exploring pathologically the bodies of these patients to find the cause of this disease that he discovered the remarkable lesion which is basic in what we now know as Addison's disease. Dr. Pepper taught that this affection is fundamentally a disease of the bone-marrow, the most important red-blood-making structure. On the other hand, Dr. William Hunter contended that pernicious anemia was caused by an excessive destruction of the red blood-cells in the portal circulation, demanding of the bone-marrow an extreme effort, and in these cases, White tells us, the marrow is red like fetal marrow and is evidently in a state of great activity and "that in its hurry to cure the disease it is constantly pouring into the blood immature forms of red cells such as megaloblasts and normoblasts, poikilocytes and red cells staining badly, which give blood films so characteristic of pernicious anemia."

The ultimate cause of pernicious anemia is most likely a toxin absorbed from the gastro-intestinal tract, but as to the exact nature of this toxin we are entirely ignorant. This supposition affords us a plausible reason why in certain cases the nervous symptoms precede by so long a period those of the blood-picture, the time incidence in either case depending on the point of initial attack by the toxin. Marie's suggestion as to the anatomic arrangement of the pial blood-vessels would account for the occurrence of the combined lesion. Its relatively poor blood-supply in health would probably make the dorsolateral cord particularly susceptible to degeneration in abnormal conditions (Taylor). Certainly such an environment is favorable, and as to the selective affinity of toxins, who can say?

The following cases are a fair illustration of the nervous syndrome occurring in pernicious anemia:

Case 1.—Miss K., aged 55, no nervous heredity, never robust but always well until fourteen years ago, when she had a nervous breakdown, was ill for two months. Two years ago she began to suffer from insomnia and loss of appetite; she complained at this time of a stuffed, bloated feeling in the stomach. She was very nervous and despondent and has continued so until the present time. Vertigo has been constant, worse in the morning; there has been continuous headache, the pain extending from the nape of the neck over the head to the forehead. Her eyes feel "as if they were pushed down." She complains of pain in both heels and small of the back, from which it extends to the front of the body and down the anterior aspect to both extremities. There is a burning sensation in the heels as though they were on fire and there is a constant shooting pain in the soles of both feet. Shortly after the legs and feet became affected she began to suffer pain in the hands; it extended up the arms, most severe between the hands and the elbows; it is intense and is of a burning, stinging character. Everything she touches hurts "as if she were touching hot glass." This pain is continuous, never lets up and seems to be steadily increasing. A year and a half ago she first noticed that her walking was unsteady and that when she attempted to wash her face she would almost fall over; she says that her legs feel as if they were wooden and did not belong to her. There is a marked weakness in both lower extremities and she finds it very difficult to arise from her chair without the aid of her hands. There is Rombergism; knee-jerks and Achilles jerks lost; the plantar reflexes plus; superficial reflexes all present with the exception of the gluteal; tactile sense impaired from below the umbilicus. Cold normal, heat exaggerated in the same area; urine normal. Hemoglobin 62 per cent, red blood-cells 4,061,000, white blood-cells, 4,112; color index .8; blood-pisture normal, blood-pressure 130 mm. Hg.

Case 2.—Mrs. O., aged 61; father died of pneumonia in his sixty-ninth year, mother of senility in her eighty-sixth year; three brothers living and well, two dead, one of diphtheria, one of acute Bright's disease; three sisters living and well, two dead, one of tuberculosis, one of apoplexy. The patient has had ten children of whom seven are living and well; one died of diphtheria, two died at birth. Climacteric at 48. For the past twenty years she has had a winter diarrhea. She began about five years ago to stumble in the dark. Although the weight is normal, yet there has been a progressive loss of strength; three years ago she noticed that she would tire very easily when walking up stairs; this effort was accompanied by rapid heart action. She complained of "rocking" feeling in the head. She has had three sinking spells lasting about a minute each time, but did not lose consciousness. The legs have grown steadily weaker and there is marked ataxia. She has been confined to bed since November, 1912. Lately she has had difficulty in starting the urine. There is a girdle sensation around the abdomen and a numb feeling in the legs to the hips and in the hands to the elbows. There is partial loss of tactile sense from the umbilicus downward. The loss of sensation in the upper extremities is more marked in the palms of the hands. Patient has a yellow color but says she has had this all of her life. Her eyesight has been poor for the past fifteen years.

When examined January, 1913, she was confined to her bed, would lose her legs in bed; there was marked Rombergism, knee-jerks normal, urine normal, hemoglobin 81 per cent., red blood-cells 3,584,000, white blood-cells 3,571, color index 1.1, no nucleated reds but poikilocytosis was marked.

Case 3.—Mr. A., aged 53; father died of myocarditis in his fifty-seventh year, mother of apoplexy in her sixty-eighth year; a brother killed himself; two sisters are living and well. The patient had diphtheria in his twenty-second year. He denies venereal disease. In 1900 he first noticed that fluid began to gather in the knees and wrists, also in the ankles (hydrops articuli); the accompanying pain was intense. In 1907 he developed artaritis deformans. His face is a lemon color; this has been increasing during the past eight months. Paresthesia in the hands and lower extremities. Impaired sensation (tactile) in both arms from elbows to finger-tips, and in the legs from the lower level of the buttocks down. Aside from Rombergism the neurologic examination was negative. The hemoglobin was 36 per cent., red blood-cells 2,120,000, white blood-cells 5,130, color index 0.9; poikilocytosis, blood-pressure 180 mm. Hg; urine, albumin with granular and hyaline casts. This is the second case I have seen this year in which nephritis was associated with pernicious anemia.

Case 4.—R., patient of Dr. Hammes, aged 42, mother died of apoplexy in fifty-fifth year, father of senility in his seventy-sixth year; five brothers living and well; one died of chronic nephritis; one sister living, but is asthmatic. The patient had acute articular rheumatism in his fifteenth year. No history of venereal disease. Five children living and well. About three years ago he began to suffer from numbness and a burning sensation all over the body. For the past eight months he has gradually grown weaker, bedridden for three months. In the last three weeks memory has failed notably. At present there is pain associated with cramp in both legs. During the last year the patient has suffered from alternating attacks of diarrhea and constipation. He can move his legs in bed with difficulty. There is marked ataxia, Babinski reflex in both feet and an impairment of all forms of sensation below the umbilicus. Hemoglobin, 46 per cent.; red blood-cells, 2,116,000; white blood-cells, 5,718; color index, 1.1; urine normal.

Case 5.—Mrs. H., aged 71; father died of cardiac disease, mother of senility in her eightieth year; five brothers living and well; one died of diphtheria; one sister living in frail health, two sisters dead, one of apoplexy, one cause unknown. Two children living and well; two died at birth; there were two miscarriages; one child died of diphtheria. Patient always well; climacteric at 48. Suffered from chronic constipation. In May, 1912, she first noticed difficulty in using hands. A cold sensation soon developed in all four extremities, also a

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tired feeling and loss of power. Patient gradually grew worse and she complained of a distressing numb sensation in heels and knees. There was at times tremor of right arm when trying to feed herself; also aching in the joints, especially of the wrists and in the bones of the forearm. There was a rapid loss in strength and weight. Diarrhea without any apparent cause occurred about every ten days. Profuse night sweats. The pain was so severe and so constant, with marked tenderness over the nerve trunks, that she was supposed to be suffering from multiple neuritis and was sent to us for treatment of that disease. Deep and superficial reflexes normal, urine normal. Hemoglobin, 62 per cent.; red blood-cells, 2,408,000; white cells, 4,280; color index, 1.3; marked poikilocytosis; nucleated reds were present.

Because leukopenia was present in all three cases it is well to recall Türk's statement that in pernicious anemia you must have leukopenia associated with the red blood-cell picture. While there is great reduction in both the red cells and the hemoglobin, this is proportionately much larger in the former, and hence each cell in order to compensate for their paucity has to carry an excess of hemoglobin. A higher color index therefore may be looked on as the constant of pernicious anemia and may be regarded as Nature's attempt at a cure (White).

The direct relation of the nervous syndrome to a diffuse primary non-systemic degeneration, occurring mostly in the spinal cord, has been definitely and clearly established. In my own case, reported before the American Neurological Association in 1896, these changes were most noticeable in the middorsal region; from this point they steadily decreased, ceasing at the third lumbar segment. Commonly the nerve roots, peripheral nerves and the gray matter escape; yet a number of cases have been reported in which the anterior horns were involved. The affection of the blood-vessels is usually slight. This degeneration is, without doubt, due to a variety of toxic causes, namely, toxins from the gastro-intestinal tract, poisons, metallic and vegetable (ergot of rye). Without doubt also this pathologic process may occur in persons with a deficient initial life-impulse in whom degenerative tendencies manifest themselves early. Anemia may precede, associate itself with, or follow diffuse degeneration of the spinal cord, but in many instances, notably the cases of Russell, Batten and Collier, there was nothing in the blood to suggest pernicious anemia. In pernicious anemia the anemia, like the cord changes, is a direct result of the toxin, be it a germ toxin or a chemical one, we do not know which. Probably in each instance the personal equation determines whether the pathologic process be a pernicious anemia with or without cord lesion, or a diffuse degeneration of the spinal cord simply. The ultimate facts are that there is a nervous syndrome frequently found in pernicious anemia dependent on a diffuse, non-systemic, primary degeneration of the spinal cord, that this syndrome may antedate by months or even years the characteristic blood-picture, and that both the anemia and spinal cord changes are the resultants of toxic influence. Contrasted with this must be the nervous phenomena incident to subacute, combined degeneration of the spinal cord with which pernicious anemia is not associated.

Byrom Bramwell, in 1874, was struck with the fatty condition of the heart in pernicious anemia, and as he had observed that arsenic was beneficial in cases of fatty heart, he commenced its use in this disease. In 1910 he began the use of salvarsan and has since treated eleven cases with it. Of these four have been apparently cured (remission?), two were strikingly benefited, one case improved at first with ultimate relapse and death, and another patient became somewhat better, but died of pneumonia while under treatment; yet another patient is slightly improved, but still under his care at the time of writing (May 24, 1913), while two patients received no benefit whatever. He regards the intramuscular injection of salvarsan as the best method of administration because it will produce a sustained and continued effect, and he thinks its use in this form much superior to the ordinary arsenical treatment. Neosalvarsan gives much less pain and swelling, and is therefore to be preferred. He uses 0.3 gm. Life being so precarious in grave cases he considers it safer to give the smaller dose. My personal experience in the use of this drug in this disease has been somewhat limited. I prefer the intravenous method and the larger dose, 0.6 gm. In Case 2 the patient was greatly benefited under its use; her nervous symptoms were rapidly disappearing when she left the hospital and she was getting so that she could walk fairly well. Current medical literature gives very conflicting reports regarding the benefit derived from this treatment; much further observation will be necessary before we can properly estimate its true value.

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ABSTRACT OF DISCUSSION

DR. GEORGE A. MOLEEN, Denver: There has been failure on the part of most neurologists, I think, to recognize the importance of blood-changes and their influence on nerve structure. The underlying systemic condition which lowers the resistance of the nerve elements to nervous influences has not been given sufficient attention. We shall, I believe, realize that this is particularly true when we recognize the increased irritability of the nervous reflex centers and the irritability of nerve structures generally in high altitudes, where, if physical factors are considered, we must remember that the amount of hemoglobin, consequently the number of red blood-cells sent to the tissues generally, must necessarily be greater in view of the lessened atmospheric pressure. That nerve structures are vulnerable to influences under anemic states, when otherwise they would not be, has, I think, been generally accepted. For example, it is not uncommon to find that a fatigue neurosis develops more readily in an anemic person than in those persons who might be considered as presenting the antipode of the anemic condition; in other words, in plethoric individuals. About two years ago I saw a number of cases of acute combined degeneration of the spinal cord. These cases have been considered as due to, or peculiarly associated with, blood-changes similar to those of pernicious anemia. I believe, however, the fact that they follow on acute infectious diseases, has been considered of more importance in producing the anemia than that the anemia is the cause of the disease itself. Most of those cases have followed influenzal infections.

Dr. Riggs has emphasized the importance which he attaches to the anemic states as bringing about nervous diseases, and this is a factor which should be given most careful attention. It is an underlying systemic factor in rendering the nervous system of these persons more susceptible to organic change under influences commonly recognized, than that of an individual supplied with a normal hemoglobin content and a full corpuscular count.

DR. HOWELL T. PERSHING, Denver: I should like to speak of a striking case that comes in one of the groups Dr. Riggs has been discussing. The patient was an able attorney. When about 60 years of age he began to show his age with great rapidity. He became quite pale, his hair whitened rapidly, he lost a good deal of weight and the expression of his face was considerably changed. While working hard at a summer

session in Washington, he noticed especially fatigue in the legs. He could walk all right for a short distance, then rapidly became fatigued, but after a rest could get along better. A few months later I had the opportunity of examining him with his family physician. At that time he was resting mentally and having some recreation; he wanted to play golf, but could not walk enough to do that with satisfaction. I could find no sign of organic disease, although he was examined with great care. In the winter he went to Honolulu and there he probably exercised too much. He had a stormy voyage coming back, and on arriving at San Francisco showed some signs of myelitis, having lost control of his legs and showing some sensory loss. He was at that time seen by Dr. Moffett of San Francisco, and later when I saw him he had definite signs of transverse myelitis. There was motor loss and distinct sensory loss, with some disturbance of the sphincters. He returned home and improved somewhat under rest in bed. The point that bothered both his physician and myself, however, was that while we thought this must be a case of pernicious anemia, and treated it accordingly, our examinations of the blood were, as we thought, quite inconclusive. There was only a moderate reduction in the reds, down to something over four million as I recollect, and the number of whites was about normal. The color index was slightly high, about 1.1. There were no normoblasts and there was no poikilocytosis. As time went on there was a continued slow reduction in the red cells, but not enough to account for his symptoms, so far as we could determine. Then an obstacle to further study occurred. The patient's daughter had died of pernicious anemia, and he had read much on the subject and studied his daughter's case with the utmost care. He was sensitive and begged to be relieved of the frequent tests of the blood. He had a horror of everything associated with anemia, even of the simple prick of the finger, and we had to respect his wishes. Toward the last week or two of his life the anemic appearance was striking. I think it was one of those cases spoken of by Dr. Riggs, without great changes in the blood. The changes in the cord were clinically distinct. It was the ordinary type of transverse myelitis, coming on with a sharp exacerbation at the time of the Honolulu visit, afterward showing slight changes and a gradual loss.

THE SERODIAGNOSIS OF PREGNANCY*

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In speaking of methods for serodiagnosis of pregnancy, I refer to the biologic tests of Abderhalden only, because the method of Rosenthal, while of considerable scientific interest, appears to be of small practical value. It is applicable during advanced pregnancy only, and all conditions associated with increased destruction of the body proteins respond to the same test.

Abderhalden's methods of serodiagnosis of pregnancy, on the other hand, give reliable information just as soon as the ovum is permanently implanted; these methods are based on specific reactions and they are suited for the widest application in the study of physiologic and pathologic conditions.

To appreciate the value and the scope of these methods it is essential to have a clear understanding of the underlying principles and to be familiar with the monumental work of Abderhalden on cell metabolism and on protective ferments, which covers a period of more than ten years of intense activity.

It appears that each body-cell, including the white and the red corpuscles and the blood-disks, carries on its own metabolism; it takes up nutritive substances from the blood, digests them with the aid of various enzymes, using the end-products of the intracellular digestion for the development of energy or linking them together into complex building-stones for the development or the repair of its own body.

The protoplasm of one group of cells differs from that of other groups of cells chemically and physically; difference of function implies difference in structure. The protoplasm of renal epithelial cells differs in structure from the protoplasm of muscular fibers; glands with internal secretion, sending out substances which act on special cells in distant parts of the body, require special structure both in the cells which send out these substances and in the cells on which they act.

Such intercommunicaton of two or more sets of cells is made possible by the fact that the intervening medium, the blood, is, under normal conditions, of pretty constant composition, and that the physical and chemical conditions in the various cell-groups likewise remain fairly even.

Nutritive substances pass into the blood from two sources: namely, from the gastro-intestinal tract and from the body-cells; before entering the blood-stream they must be divested of all individual character and be reduced to the simple cleavage products which form normal constituents of the blood.

For the purpose of this paper I shall limit this review to protein metabolism.

Protein foodstuffs, no matter what their source, are conglomerations of amino-acids; these are joined together into small groups like the blocks in a Chinese puzzle; the amino group of the one acid is always joined to the carboxyl group of the other; these small groups are joined together to larger and still larger groups, until they form the large albumin-molecule.

So firmly are these amino-acids joined together, that nothing short of repeated blasting will separate the albumin molecule into its original building-stones; this blasting is accomplished by the ferments of the gastro-intestinal canal with the aid of water, which enters at the points of juncture, that is, by hydrolysis.

The work of reducing the albumin molecule to amino-acids is a gradual one; the pepsin of the stomach in the presence of hydrochloric acid breaks it up into large fragments, proteoses and peptones; the trypsin of the pancreas, activated on entering the intestines, reduces these large fragments into smaller ones, the peptides and amino-acids; the enzyme found in the cells of the intestinal mucosa, the erepsin, completes the reduction into amino-acids.

Substances which are absorbed from the intestinal canal must pass through the liver before they can get into the general circulation. Here they are once more closely inspected by the liver-cells and, if anything has passed that is in the least degree foreign to the blood, it is held back and reduced to a blood-own substance. The liver likewise prevents a flooding of the system with blood-own substances by holding back an excess of such substances and letting them pass on in small quantities only, or by converting them to forms which can be stored up in the body for future use.

The other source from which nutritive substances and products of metabolism enter the blood-current is from the cells of the body.

All cell protoplasm is foreign to the blood; it has been built up by the cells from the amino-acids which are blood-own and it must be reduced to its original components before it can be allowed to enter the blood.

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The lymphatic system is interposed between the cells of the body and the blood-current; the leukocytes and the lymph-vessels stand guard that no blood-foreign material enter the blood through this channel; substances that are not fully reduced are held back and converted into blood-own substances before they are passed along.

By these arrangements, and with a checking system at each point of entrance, the blood remains fairly constant in composition and, under normal conditions, the plasma contains no proteolytic ferments.

Under certain conditions blood-foreign material will enter the circulation in spite of these safeguards.

Overloading the stomach with protein foods may paralyze digestion and upset the checking system of the liver; inflammation of the various organs and other pathologic conditions, such as germ invasion of the tissues, will cause the cells of the respective organs to pass such quantities of unreduced substances that the lymphatic system is unable to prevent their passage. Malignant and kindred cells, such as those of cancer, of sarcoma and of the syncytium, may pass sufficient quantities of blood-foreign substances to force them into the blood-current; or they may eat their way into the blood-vessels and thus enter the circulation. Bacterial invasion of the blood means the entrance of blood-foreign material in a double sense; living, the germs pass the products of their metabolism into the plasma, and dead, their bodies constitute blood-foreign protein material.

Finally, blood-foreign material may be introduced into the circulation by intravenous or subcutaneous injection.

The system responds to the entrance of the blood-foreign material by the mobilization of ferments, which appear in the plasma and reduce this foreign material to blood-own substances, which may be utilized by the cells of the body or which may be eliminated by the various organs of elimination.

These enzymes are specific in the sense that they are active only against the substances to which they owe their existence; Abderhalden has named them the protective ferments.

For instance, if fresh kidney extract is injected into an animal, the serum of that animal, taken four days afterward, will digest kidney-albumin and kidney-peptone; this digestive power is greatest if the kidneys used for the extract and for the albumin are from the same species; such serum is not active against any other tissue.

The presence of these proteolytic ferments is easily proved by the dialyzation method in the following manner: the tissue against which the serum is to be tested is boiled, so as to coagulate its albumin; a certain quantity of this albumin, together with a certain quantity of the serum, is placed in a dialyzing thimble; the thimble so charged is immersed in a vessel containing a certain quantity of distilled water; for control another dialyzation test is made in which the same quantity of albumin, the same quantity of serum and the same quantity of distilled water are used, but with the difference that the serum for the control has been heated so as to destroy all ferments which it may contain.

Albumins are colloid in nature and do not dialyze; as digestion progresses the albumin molecule is split into smaller and smaller fragments, which become more and more dialyzable, so that when the peptone stage is reached it is possible to demonstrate the presence of peptone in the distilled water by color reaction; the biuret reaction gives a pink color and the ninhydrin reaction gives a characteristic violet-blue color; the distilled water of the control, tested in the same way, must remain colorless.

If digestion is carried further the distilled water of the test will no longer give the biuret reaction because all peptone has been reduced to amino-acids, but it will continue to give a beautiful ninhydrin reaction.

The presence of these ferments can also be demonstrated by the optic method in which the serums are tested against peptones prepared from the respective tissues.

This method requires expensive apparatus and considerable technical training, but it contains fewer sources of error and can be applied in the study of questions for which the dialyzation method is not adapted.

My own experience with these tests is still limited to the dialyzation method, because it took considerable time to assemble the apparatus and to obtain placental peptone for the optic method, and it will take considerable more time for my associates and myself to become sufficiently familiar with the work to take it up in earnest; we expect the same large portion of trials and tribulations which we encountered in becoming acquainted with the dialyzation method.

While using the biuret reaction exclusively, I had some negative results in cases of advanced pregnancy, because digestion was carried too far; since using the ninhydrin reaction I have obtained positive results in some non-pregnant cases, because I worked with too large quantities of serum; at all times I have had conflicting results due to various sources of error such as bacterial growth, unclean glassware, leaky dialyzers and improperly prepared albumin; these errors and the time-consuming work of locating them I consider a most valuable experience.

On the other hand, I have the records of twenty-one pregnant and four puerperal cases, in which the test invariably has given the violet-blue ninhydrin reaction, while the control remained colorless; these cases cover the period from twelve days after the missing of the menses to the fourteenth day post partum; I also have the records of eighteen non-pregnant cases, including several tubal enlargements, four uterine fibroids and two males, in which the dialysates of both test and control remained colorless.

In all these cases I have personally done every part of the work with the exception of taking the blood from the patient, which has always been done by my associates, Drs. Newell and Royston, who are experts in securing hemoglobin-free serum.

In eight instances the serodiagnosis has been employed as the only means of differential diagnosis, and in every one of these eight cases its answers have been true. One of these was the case of a girl twelve days overdue on whom criminal abortion had been attempted, but who denied the charge and refused pelvic examination; two patients in whom tubal pregnancy was considered by the physicians in charge proved non-pregnant; the one had a pyosalpinx which was removed by operation, the other had a chronic parametritis; of two women between forty-five and fifty years of age, one, who had never been pregnant and who had menstruated regularly until eight weeks before the test was made, proved to be non-pregnant, and the other, whose youngest child was 18 years of age, and who likewise was four weeks overdue, proved to be pregnant; of three other patients one, with irregular bleeding without having passed the menstrual period, proved pregnant, and miscarried soon afterward; another, a young woman with irregular menstruation who had often skipped two or three months and was again eight weeks overdue, proved non-pregnant and the menses returned later; in still another in whose case

there were good reasons for interrupting a possible pregnancy and who gave a positive reaction when two weeks overdue, I emptied the uterus and removed the ovum.

In all of these cases the control was carried on with inactivated serum and placenta; these tests were always made in the presence of interested physicians, and for this reason the control was extended to the examination of a case positively pregnant and to another case positively not pregnant.

The test with positively pregnant serum is desirable because we have found that one can by repeated boiling and reboiling of poorly prepared placental albumin, which has undergone autolysis, get rid of most of the albumin and obtain a placental preparation which will no longer give the ninhydrin reaction in its usual intensity.

While I am much interested in these biologic tests on account of their diagnostic value, I prize them still more highly because they open up a wonderful field for the serologic study of pregnancy, and because they may lead to a rational serotherapy of the toxemias, including eclampsia.

It has been proved that throughout pregnancy blood-foreign substances are passed from the placenta into the maternal blood-current and that the maternal system responds with the mobilization of protective ferments, which cause the intravascular digestion of this material.

Evidence is accumulating which indicates that in toxemic conditions the formation of protective ferments is deficient, and it appears rational to correct this deficiency by the subcutaneous or intravenous injection of normal pregnancy-serum.

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ABSTRACT OF DISCUSSION

DR. JOSEPH B. DELEE, Chicago: This subject has the broadest application and opens up a vista of possibilities which is as extensive as it is alluring. The human serum reactions interest many departments of surgery and medicine. On the injection of albumin into the blood the blood reacts with the formation of a ferment. A certain kind of albumin develops a certain kind of ferment. The highest kind of laboratory work is required for the practical development of the fine details of the subject. The asepsis of the serums must be looked after because the action of bacteria will reduce the albumin and it will then dialyze through the tube when otherwise it would not. There is difficulty, also, in getting tubes of proper dialyzing power. In diagnosis, when the question is whether a certain tumor in the pelvis is a pregnancy or something else, it is not impossible to imagine that, if it is a fibroid, manipulation will set loose an amount of albumin in the blood-stream and we will immediately get a reaction analogous to that of pregnancy serum and again, a fine differential analysis will be necessary. Ries of Chicago recently demonstrated a uterus in which a pregnancy had not occurred for eighteen years and which still had placental villi in some of the veins showing that the villi had retained their nourishment for a long period. Playfair's case proves that placental tissue can live in the uterus for eleven months. You can see at a glance how valuable a test of this kind is. From 2 to 3 c.c. of the woman's blood-serum we can tell whether she is pregnant or not. Dr. Schwarz has spoken of the importance of determining the presence of these bodies in arterial hypertension, including eclampsia. Perhaps these serum tests will clear up the question of post-partum hemorrhage. Some of these cases are due to the disorganization of the blood—the result of changes in pregnancy. The discovery opens up an immense field for study, not alone in obstetrics, but in all branches of medicine.

DR. CHESTER M. ECHOLS, Milwaukee, Wis.: I have been working on this test and have just lately gained some confidence in the results of the reaction. We all have had the experience of stumbling through several months of uncertainty, getting positive results in our control and negative results in patients known to be pregnant. In my last twenty or twenty-five cases of women known to be pregnant the results have been positive in every one and negative in the control except in a few cases where the control patients had other diseases. One thing gave me confidence in the test—the character of the man who devised it—Abderhalden. After three hundred consecutive positive results he still warned the profession against accepting his work at its face value, because, he said, there might be other diseases which would give a positive reaction. There are a number of fallacies which must be weeded out before we can accept this test at its final worth, but to-day no one is prepared to say the last word, although I think that it will be an exceedingly reliable test, as tests go. We know that the Widal test is not absolutely reliable. We know that there are other conditions than syphilis that will give the Wassermann reaction, and yet these two tests are valuable. To my mind, this will be the final result of our work on the Abderhalden test.

DR. N. SPROAT HEANEY, Chicago: I wish that Dr. Echols had given us his experience in percentages. I did not hear Dr. Schwarz's statistics, but I gather that he has had no failures of the test. One year ago I became interested in this test. At first I worked to see if I could demonstrate an increased peptolytic power of the blood-serum in pregnancy by titration to the amino-acids, before and after incubation of the blood-serum, with peptone solution. I found that the peptolytic activity varied, and that this variation could not be brought into correlation with the gravid or non-gravid state of the patient, but that it depended on some other set of circumstances not elicited. This year we began to try Abderhalden's dialysis method of testing. We have not made a large number of tests, about twenty-eight altogether, but every few weeks we have made all the modifications of the test, as suggested by Abderhalden. The test reacted negatively twice in the presence of normal uterine pregnancy. One healthy woman who was not pregnant gave a positive reaction. We had five diseased persons who were not pregnant react positively; two males with syphilis, a woman with extensive ulceration of the rectum, a woman with tuberculous peritonitis, who had had a hysterectomy the previous year, and a woman with a fibroid uterus. Several others have not had the uniform results that Abderhalden has published and the statement that all negative results depend on defective technic does not satisfactorily explain the situation of this test among laboratory methods.

DR. HENRY SCHWARZ, St. Louis: In the short time given for discussion we cannot hope to settle questions of the importance of this one. All I can advise Dr. Heaney to do is to publish his cases with a detail of his technic and I have no doubt that the answer will be found. Professor Abderhalden, in the discovery of these ferments, has opened a new field and the diagnosis of pregnancy is only a trifling part of this work. I am quite sure that we should be careful before we talk of these questions as matters of absolute belief. We believe, but we have to prove our belief. The only way to prove this question is by publishing the detail of methods. I have no doubt that others will either convert us to their views or we shall convert them to ours.

Need of Accuracy in Medical News.—Our best newspapers take pains to have their financial articles written by those familiar with the subject; they also scan the source and the authority of the informant giving news of the day. Should not the same rules prevail in publishing scientific knowledge, whether medical or other? Why should the assignment be made to a bright reporter to work up the "story" about a serum unless that "story" be edited by one who is thoroughly acquainted with serums and their action? A great deal more harm is done by awakening the expectancy of the ill in the promise of a remedy which eventually fails than in getting up a war scare.—*Bull. Am. Acad. Med.*

DURATION OF IMMUNITY FOLLOWING SMALL-POX VACCINATION*

A. W. LESCOHIER, M.D.
DETROIT

A certain degree of reticence is felt about recording observations on the subject on which so much work has been done and with which I have had a relatively short experience. The collection of the present data, however, was prompted first, by the observation made in a larger series of cases that successful revaccination after relatively short intervals is met with surprising frequency, and, second, the variance of my results with the ideas commonly held by physicians with whom I have come in contact. In dealing with patients reporting for compulsory vaccination, and who have a certain degree of antipathy to being inoculated, not infrequently objections are offered based on statements alleged to have been made by physicians by whom they have been previously vaccinated. If the patient has an unusually sore arm not only he, but sometimes his physician as well, is inclined to believe that a permanent protection has been conferred.

I was directly prompted to report my observations by an editorial appearing in *American Medicine*, in February of this year, and from which the following quotation is made: "It is almost a rule for revaccination to be unsuccessful, and there are no cases of small-pox on record in which there is a history of proper vaccination and revaccination which have undoubtedly been successful." A little further on the editor refers to certain statistics published by Dr. Kitasato of the Imperial Institute of Tokio and said: "He estimated that immunity was practically gone ten years after vaccination. These figures cannot be accepted for a moment. The error was doubtless due to mistaking an inflammation from pus organisms as an evidence of successful vaccination. The British Royal Commission states that immunity generally lasts for nine or ten years, but it is justifiable to conclude that the evidence on which this opinion was based was also defective from the inclusion of spurious cases. Proper vaccination is far more effective than this, and we revaccinate entirely too often." From these quotations it is evident that the editorial writer believes immunity from vaccination to be practically permanent in most cases.

Kitasato's results, which were the object of this criticism, were based on a series of 931 revaccinations. He obtained successful revaccinations approximately as follows:

After 1 year 14 per cent.	After 6 years 64 per cent.
After 2 years 33 per cent.	After 7 years 73 per cent.
After 3 years 47 per cent.	After 8 years 80 per cent.
After 4 years 57 per cent.	After 9 years 85 per cent.
After 5 years 51 per cent.	After 10 years 89 per cent.

Millard[1] states that the government report of the German Confederacy shows from 91 per cent. to 93 per cent. successful revaccinations after ten years from the primary, and concludes with the statement that "immunity acquired through vaccination begins to disappear from the second year, and by the tenth year it disappears almost completely."

These different opinions are mentioned simply as illustrating the decided variance of ideas in regard to this question. It would seem as though the subject were worth more than a passing consideration, both because of its relation to public health and because of its bearing on the antivaccination movement. It can scarcely be questioned that systematic revaccination is almost as important as the initial inoculation, and that modern methods of small-pox prevention must take this into account. A system of infantile vaccination which is not followed up by revaccination is only a half measure, and half measures often do a great deal of harm, because they create a false sense of security. Furthermore, if a vaccinated person, whose immunity has lapsed, contracts the disease, it creates a bad effect on the community in which he lives, a distrust in the efficacy of vaccination as a preventive measure.

The literature shows a surprising dearth of data on duration of immunity, presumably due to the difficulty of obtaining definite histories on cases reporting for revaccination, and to the fact that revaccination is not carried out in a systematic way. As a general rule, revaccination, and in a great many sections it is unfortunately true of primary vaccinations as well, is performed only in the event of a small-pox scare and under circumstances which are not favorable to the collection of statistics.

In the present series we had a total of over five hundred cases, sixty-six of these being primary. In only two hundred and fifty-one of the secondaries were we able to get a history as to previous vaccination. It may be mentioned that in considering the periods since previous vaccination no recognition was given to negative inoculations, the history being taken from the last successful vaccination.

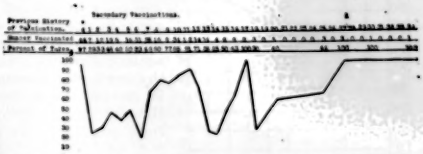

Fig. 1.—Chart showing results of secondary vaccinations. Total number vaccinated, 317. Primary cases vaccinated, 66. Secondary cases vaccinated, 251. Per cent. of takes in primary cases, 97. Per cent. of takes in secondary cases, 58. Star (Footnote *) indicates primary vaccinations. Following figures indicate lapse of years since a successful vaccination.

RESULTS OF REVACCINATION OBTAINED IN THESE CASES WERE AS FOLLOWS:

INTERVAL IN YEARS SINCE LAST VACCINATION	NUMBER VACCINATED	PERCENTAGE OF "TAKES"
1	7	28
2	12	33
3	19	48
4	5	40
5	16	50
6	31	23
7	25	68
8	15	80
9	9	77
10	34	85
11	12	91
12	14	71
13	14	28
14	4	25
15	8	50
16	8	63
17	2	100
18	3	33
20	5	60
25	3	66
27	3	100
30	1	100
34	1	100

With the exception of the patients vaccinated after the first year our results accord fairly well with those reported by Kitasato.

* Read in the Section on Preventive Medicine and Public Health of the American Medical Association, at the Sixty-Fourth Annual Session held at Minneapolis, June, 1913.

1. Millard: Brit. Med. Journal, March 22, 1913.

It is highly improbable that in the larger series of cases we would have as high as 28 per cent. "takes" in patients who had been successfully vaccinated the year previous. This has been regarded as being more or less of a coincidence, but the fact that revaccination is frequently successful after intervals of from one to three years is in itself significant, and indicates the advisability of the physician being somewhat guarded in statements made as to the duration of immunity, and points to the importance of systematic revaccination.

The question arises as to whether some of the cases included in this series and classed as successful vaccinations might have been spurious ones, as has been suggested in the editorial above referred to, pyogenic infections being mistaken for successful inoculations. This hardly seems probable as there is usually no great amount of difficulty in differentiating between a pyogenic infection and a vaccine pustule, and I believe that I have been reasonably careful in drawing conclusions.

It must be freely admitted that the successful vaccination of these patients is by no means evidence that they would have been susceptible to natural small-pox. It is reasonable to suppose that a higher degree of immunity would be required to resist the direct inoculation than would be necessary to protect the patient against infection in the usual way. Furthermore, clinical experience has demonstrated that systematic revaccination even at intervals of ten years is very efficient in protecting a country or community against small-pox. In Germany revaccination is carried out in the eleventh year, while small-pox is very rare; the same is true of Japan, and it is a universal experience that small-pox in individuals who have been successfully vaccinated within five or six years is decidedly unusual. In this connection, King reports, in the *Lancet* of May 17, 1913, some interesting data based on observations made on Asiatics (Shans, Burmese and Chinese). In a group of 380 adults who had been vaccinated when under 15 years of age, 5.6 per cent., and in a group of ninety-four who had been inoculated above that age, 3.2 per cent. had been attacked by small-pox in later life. In a series of 312 patients who had been inoculated under fifteen years, vaccination resulted successfully in 80.3 per cent, and in twenty-two with a history of having been previously vaccinated after their fifteenth year, 81.8 per cent. resulted in "takes." In ninety-six adults, who had suffered from natural small-pox at various ages, and who were freely marked, 75 per cent. were successfully vaccinated.

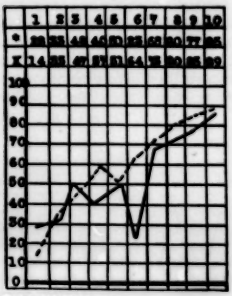

Fig. 2.—Comparison with Kitasato's results. The results in the present series are indicated by solid line and starred figures. Kitasato's results are indicated by dotted line and figures preceded by K.

It can scarcely be doubted that our present system of vaccination is not sufficiently rigid, and that a single successful vaccination confers a false sense of security, not only on the patient, but in many instances on the physician as well. The disease has been widely disseminated during the last year or so, and the indications are that the country as a whole is far from being well protected. In view of the general apathy of the medical profession toward vaccination this is not especially surprising. While the great bulk of medical practitioners undoubtedly believe in vaccination, it is in many instances afforded only a half-hearted support, and is rarely urged by the family physician, excepting in the presence of an epidemic of the disease, or in the case of direct exposure. Even in large cities one is surprised to learn of the large number of people who have never been vaccinated, and in small towns and country sections vaccination is even more neglected. The majority of those from rural districts who have reported to me have never been vaccinated, or even been approached on the subject. These phases of the question, of course, have nothing to do with the present subject, and are merely mentioned in passing as being, with the transient immunity, factors which contribute to the prevalence of small-pox in the United States.

555 Sheridan Avenue.

ABSTRACT OF DISCUSSION

Dr. C. N. Hensel, St. Paul, Minn.: I have examined about a thousand cases of small-pox in my work in the St. Paul Health Department. Of this number, but four patients had been previously successfully vaccinated and showed a definite, typical scar. In these four cases the greatest interval from the last successful vaccination to the contraction of small-pox was twenty-seven years; the shortest interval was twenty years, the intervals in the two remaining cases being twenty-six and twenty-four years, respectively. To find but four cases in a series of a thousand contracting small-pox after previous successful vaccination, and to find the period of immunity ranging from twenty to twenty-seven years, naturally leads to the conclusion that the protection afforded by successful vaccination lasts longer than shown by the records of Dr. Lescohier. This conclusion might be changed by observation on a much larger series of cases, and we might find a much shorter interval between successful vaccination and the contraction of small-pox. I wish to mention an interesting case in which small-pox developed a second time in a person who had previously had the disease. The patient, a boy, aged 9, had, when six months old, contracted a severe attack of small-pox from his mother. The mother gave a clear and definite history of this illness. Eight and a half years later the boy was exposed to small-pox a second time and contracted the disease. I saw him during convalescence from the second attack, with the unmistakable signs of small-pox—the dying lesions on his body and the hard, brown scabs beneath the skin of his palms. The second attack was mild, and there were but ten or fifteen lesions on the entire body. I mention this case to add it to the few previously recorded where a person has developed small-pox a second time. The second attacks of small-pox, as a rule, develop many years after the initial attack. This case seems unique, in that the patient developed the second attack so comparatively soon after the first illness.

Dr. V. C. Vaughan, Jr., Detroit: At one time we were unfortunate enough to have a mild epidemic of small-pox in the engineering department of the University of Michigan; in fact, it was so mild that it was not ascertained until we found one of the students picking off some scales, and on subsequent examination found that he had been afflicted with small-pox. We went through that department and found that every unvaccinated person had had small-pox in this very mild form. Another thing about which I wish to speak is the work which has been done in connection with revaccinations and the character of the reaction which we obtained in revaccination. I understand—although Dr. Lescohier's experience is much greater than mine with reference to this matter—that it is seldom that we get the typical reaction which we obtain in the original primary vaccination. Von Pirquet has

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done a great deal of work on accelerated vaccinations and he has shown that revaccination may be accomplished—may actually represent a true vaccination—and still not be noticed by the attending physician who is looking for the development of the typical lesion. According to the theory of sensitization advanced by Dr. Vaughan, the vaccine body causes a reaction in the body of the person that leads to the production of a ferment, which subsequently causes cleavage of the vaccine body. This same ferment, of course, causes cleavage of the small-pox organism when it gains entrance to the body, and in that manner renders the patient immune. If such a person is revaccinated, if there is a large amount of ferment present the vaccine virus is attacked immediately, before it has had time to grow and multiply, and we have no reaction. If a certain amount of ferment is present, but not sufficient to attack it at once, then we have a mild, but an accelerated, reaction. I think physicians usually vaccinate themselves every time they see a case of small-pox. I certainly do, and I have had a take only once, but on several occasions I have had a notable reddening and itching there. I have said—and other physicians have made the same statement—that I would think it were a take, unless it had come on too early and subsided too rapidly. It really is one of these accelerated von Pirquet reactions, which may be used as a judge of the amount of immunity to the vaccine bodies.

DR. C. A. HARPER, Madison, Wis.: As a field man, I think my observations have strongly confirmed the results observed by Dr. Hensel and Dr. Vaughan. I have made personal observations of about eight hundred cases of small-pox, and only about two patients really had what we would call typical vaccination scars. All the others were either unvaccinated, or a few had scars which would be similar to a scar of infection, and not a typical vaccination scar. I believe that the appearance of small-pox in the field, after one successful vaccination—with the character of small-pox, particularly, that we have been having in this country—is an extremely rare occurrence. I am of the opinion that a revaccination will work much more frequently than small-pox attacks an individual who has been successfully vaccinated. I was vaccinated when a child, then I went into a line of work where I was to be frequently exposed to small-pox. I was vaccinated every year for a period of eight years. Each one of those years I was exposed to small-pox from fifty to two hundred times. In the eighth year the second vaccination took, but I have not had small-pox. I feel that the degree of immunity, with the small-pox that we find to-day—mild in character as it is—is almost absolute, after we have what we call a typical vaccination scar implanted on the body of the individual.

DR. P. M. HALL, Minneapolis: I wish to confirm what Dr. Harper has said: Having been in field work during the past twelve years, and having seen probably about five thousand cases of small-pox, it has been my general observation that we do not see small-pox in those who show a typical vaccinal scar. I will go further than that. I never saw a death from small-pox—and have seen some cases of very virulent type—in a person who gave a history of ever having been vaccinated. With reference to the question of immunity, one peculiar case arose which I have never seen duplicated, showing the beneficial effects of vaccination after a definite exposure. The father of a family was removed on Sunday with definite small-pox, almost in the pustular stage, leaving behind a wife—pregnant and soon to be delivered—and two children, the wife and children never having been vaccinated. They were vaccinated immediately; the vaccinations took, the husband and father being removed the same day. Exactly two weeks from that date (the father still being away) the woman was confined, having a successful, working vaccination on her arm. Her baby took small-pox four days afterward and died.

DR. C. HAMPSON JONES, Baltimore: My practical experience, and what I have read on the subject, has caused me to advocate that every one should be revaccinated at least once in ten years. I have had to deal with several outbreaks of small-pox—in 1899, 1901, 1905-6, and in 1912-13—not one of them with many cases, but all requiring a great deal of activity on our part to lessen the number of cases. With the exception of one man in 1899, in none of these outbreaks were there cases of small-pox in those who had been previously vaccinated, so far as the evidence of the vaccination scar showed. In the last outbreak, which began on Nov. 11, 1912, and the last case was on March 1, 1913, there were fifty-seven cases of small-pox, and not one of those patients had ever been previously vaccinated—there certainly was no scar. On the other hand, every one who had been successfully vaccinated and whom we knew to have been exposed to small-pox escaped. I am inclined to believe that we need careful and lengthy investigation to give us some idea as to the length of time that vaccination gives us protection. According to the number of removes from the original inoculation of the small-pox into the cow, the experimental evidence will show how each one will vary in the length of time of protection given to the unvaccinated individual. I also think that there undoubtedly is a great deal in the length of time than an unvaccinated and a vaccinated person are exposed to small-pox. For example: We segregate those—particularly among the negroes—who have been exposed to small-pox and were not previously vaccinated. It happens, over and over again, that those who have been exposed to small-pox for the first twenty-four or forty-eight hours of the eruption do not contract the disease. On the other hand, if there has been three, four or five days' exposure, it is quite certain that those who have been exposed will be stricken with small-pox.

DR. HAROLD B. WOOD, Rochester, Minn.: It might be well to correct an impression that seems to be circulated throughout the United States, that is, that Minnesota had stopped quarantining for small-pox a few years ago. We have had a number of letters asking how small-pox is controlled in this state. People have an erroneous impression that nothing whatever is done to segregate the people having small-pox. The people are not quarantined as the word is popularly understood in the East and South, but the people who have small-pox and who have not been vaccinated previous to one week before the exposure are actually quarantined within the household and the house is placarded. Compulsory vaccination is not legal here, but those who are exposed are given the option of vaccination within three days after exposure or of being quarantined three weeks. Where this quarantine with placarding has been carried out, there have been no return cases, so far as my records show. There has also been a marked decrease of small-pox in the state since the inauguration of the system. The disease, which has been epidemic throughout the country, has been carried on by cases which have not been discovered and are, in nearly all instances, extremely light cases. Some physicians and the majority of people do not realize that some of the extremely mild infections, where the vesicles are about one-tenth the diameter of the ordinary small-pox pustule, may be highly infectious. We have evidence that severe cases have been transmitted from extremely mild ones in which there are no pustules or scar formation.

DR. GUY L. KIEFER, Detroit: There is a practical suggestion in the paper of Dr. Lescohier, urging us—by us I mean practical health officials—to require vaccinations in all cases of exposure more frequently than we have done in the past. My experience corroborates that of the field men, as they call themselves, who have spoken, and shows that immunity against small-pox, following vaccination, lasts apparently much longer than the immunity against a reinoculation with vaccine virus, and yet there are patients who are taken sick in less time than some of us suppose. For example, the first series of cases that I compiled was about eleven years ago, when we had an outbreak of mild small-pox, consisting of 1,023 cases, and of those, 862 patients had never been vaccinated successfully; 129 had been vaccinated, but in each case the period had been longer than five years, and in most of them longer than ten years, only 32 had been successfully vaccinated within a period of five years or a shorter time, according to their own testimony. We find, from the experiments given in Dr. Lescohier's paper, and from those he quoted, that about 50 per cent. of the persons will be susceptible to a second vaccination. It seems to me a practical sug-

gestion that we might, in all cases of exposure, require the vaccination of all people who have not been successfully vaccinated within five years, and then, according to experiments, in at least half of them the vaccination will "take" and it will satisfy the community—it certainly will not do any harm—and it will be the limit of protection.

DR. A. W. LESCOHIER, Detroit: I sincerely hope my paper did not carry the impression that I believed that persons who are successfully revaccinated after one or two years would be susceptible to small-pox. I think the evidence, not only in this country, but all over the world, shows that in cases of small-pox in which there is a history of successful vaccination, even if ten or twelve years have elapsed, are rare. This is shown in Germany and Japan, where systematic revaccination is carried out in the eleventh year. The object in presenting these statistics was to indicate the advisability of a systematic revaccination, rather than to throw any discredit on vaccination as at present carried out—that is, infantile vaccination not followed up by revaccination. We cannot but believe that vaccination, even if only carried out in infancy, is the most effective means which we have in stamping out small-pox, but if it can be followed up after a reasonable number of years by reinoculation, the chances of completely controlling the disease will be much better.

A SIMPLIFIED METHOD OF DIRECT BLOOD TRANSFUSION WITH SELF-RETAINING TUBES

L. H. LANDON, M.D., PHILADELPHIA
Assistant Surgeon, University Hospital, Philadelphia

The tubes here described were devised some four years ago, primarily for arterial or venous anastomosis and as such were used successfully by me while working in the Laboratory of Experimental Surgery of the University of Pennsylvania, under the direction of Prof. J. Edwin Sweet, to whom I am indebted for many suggestions and helpful advice in the development of the technic.

In the hands of the average surgeon, especially where the operation has to be done outside a hospital or with untrained assistants, the cannulas of Crile or Sweet present certain difficulties in their use, chiefly in applying the retaining ligature and at the same time keeping the end of the vessel properly cuffed back over the tube. Several attempts may be necessary to accomplish this, which is not only trying to the operator but usually ruinous to the success of the operation. The tendency is for the end to retract persistently, hence two assistants are necessary while the operator is adjusting and tying the ligature, and even then the very restricted field, in which at least five hands must work, often adds to the difficulties.

To obviate these disadvantages to a large extent and at the same time to produce a tube suitable for permanent anastomosis in emergency wounds of vessels, the self-retaining cannula was devised. With it any physician can, even with very little experience, quickly perform a successful transfusion.

The tubes, three in a set, vary in diameter from 3 mm. to 5 mm., which gives a sufficient variety to suit most cases. They are 6 mm. in length over all, the tube proper being 4 mm. One end is plain while the other carries five small sharp retaining points arranged at equidistant points around the circumference. These points are slightly flanged outward, and may be bent to any desired angle to suit the individual case. On two sides of the tube about its center and opposite one another are small holes which fit accurately over the two lateral projections on the tips of the blades of the special forceps which serves as a handle, the set-screw holding the forceps tightly in the tube while it is being introduced.

The proper-sized tube having been selected, it is fitted to the handle, the retaining end of the tube being nearest the forceps. The artery or vein is then pushed or pulled through the tube from behind forward, its circumference grasped at three points with mosquito forceps and the vessel cuffed back over the tube, gradually working it back until it can be drawn over the sharp retaining points which pierce it and hold it accurately in place. The tonicity of the vessel walls causes it to hug the tube and hold it over the points. The other vessel, grasped likewise with the mosquito forceps, is now drawn over the cuffed-back vessel on the tube until it also catches on and is held by the points projecting through the walls of the first vessel. After the flow has been started the set-screw is released and the handle forceps is then easily removed, obviating any undue traction on the anastomosis during the transfusion.

The technic is simple, being, with the exception of the tubes, the same as that of Crile, although not requiring the same delicacy and the experience as do the other methods. One should always bear in mind the necessity of doing as little damage as possible to the vessel walls during the manipulations and that the exposed intima should always be well covered with liquid paraffin or kept constantly moistened with saline solution.

1819 Chestnut Street.

Fig. 1.—Instrument two-thirds size.

Fig. 2.—First vessel cuffed back over the tube, the points catching wall.

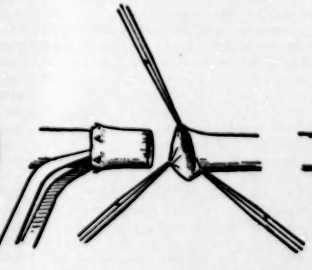


Fig. 3.—Same as Figure 2 with forceps removed and vessel in place.

Fig. 4.—Second vessel grasped with forceps.

Fig. 5. — Operation completed and forceps removed.

AN ADJUSTABLE BED-FRAME

E. VICTOR KELLER, M.D., CANTON, MASS.
Assistant Physician at the Massachusetts Hospital School

The Bradford bed-frame has come to be regarded as practically indispensable in the care of many surgical diseases in children requiring bed treatment; and having experienced considerable difficulty in always finding a frame of the proper width and length to fit an individual case even though a

large number of frames were available, a method of adjusting the ordinary gas-pipe frame was devised.

Although very simple and inexpensive, it has been found most convenient and has done away with the annoyance of having to wait until a frame could be made, as well as the expense and inconvenience of having a large number of frames constantly on hand.

The following description is presented in the hope that an adjustable frame, which can easily be made to fit any average child under 15 years of age, may be of value to others.

Ordinary gas-pipe is used in standard stock sizes as follows, and can be purchased at any plumbing or pipe-fitting concern:

Two pieces of ¼ inch galvanized pipe 8 inches long.
Two pieces of ¼ inch galvanized pipe 30 inches long.
Two pieces of ½ inch galvanized pipe 6½ inches long.
Two pieces of ½ inch galvanized pipe 50 inches long.
Three ½ by ½ inch elbows.
One ½ by ¼ inch bushing.
One ½ by ½ inch elbow.
Four ½ by ⅜ inch coupling.

The ½ by ⅜-inch coupling without threads in the ⅜-inch end should be used. On one end of each of the ½-inch pipe the threads are cut for 1 inch, which is about twelve threads. Then the two end threads are filed down and will pass into the shoulder of the ⅜-inch end of the ½-inch coupling, increasing the binding over the ¼-inch pipe that telescopes into the ½-inch pipe.

The foregoing four ends must be quartered by placing two blades in hack saw, making cuts ½ inch deep. This should be done after the threads have been cut which enables the ½-inch pipe to clamp more firmly the ¼-inch pipe.

Adjustable bed-frame.

The other four ends of the ½-inch pipe should be threaded for half an inch or seven threads; but one end of the ¼-inch pieces needs threading as the other ends pass into the ½-inch pipe. The ½ by ¼-inch bushing is used in one elbow which receives two ¼-inch pipes.

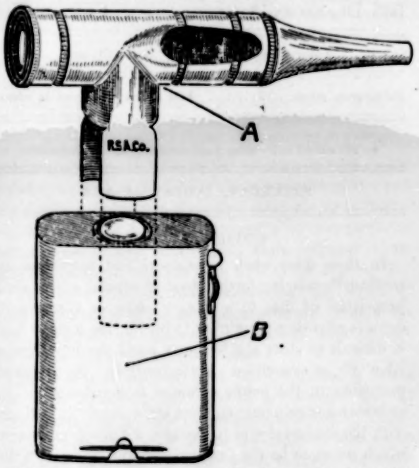
After connecting pipes to elbows, one must be careful to have them at perfect right angles as well as to have the pipe straight so that they will not bind when telescoping. I have found that ether will clean the pipe most satisfactorily after the frame has been put together.

A Stillson wrench is necessary for adjusting this frame to the required length and width.

ILLUMINATED EAR SPECULUM

FREDERICK A. KIEHLE, M.D., PORTLAND, ORE.

The accompanying drawing shows a very satisfactory device for the examination of the ears of patients who are confined to bed. Most physicians are familiar with the difficulties involved in procuring a drop-light and a head mirror in a hospital ward, or the assistance necessary in holding a light and maintaining the proper position of the patient. In the illustration *A* represents the illuminated ear speculum from an outfit designed for use with portable dry cells and wire attachment. The electric light and the attachment plug, however, have been removed, and the vertical cylinder split into two flanges which will slip down as shown by the dotted line, holding *A* firmly on *B*. Within the horizontal cylinder is a mirror fixed obliquely and with a central perforation which throws the light rays from below forward through the speculum and against the tympanum. The fenestration at the side permits of applications being made or a probe passed through the speculum. *B* is simply one of the smaller flat-sided designs of a pocket battery, and should be reversed in the drawing so that the press-button is immediately under



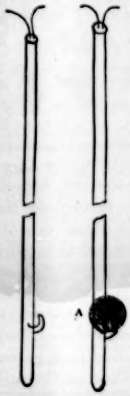
Device used in examining ears of patients confined to bed.

the eye-piece. The whole apparatus slips readily into the pocket and is instantly available for use.

A COIN-CATCHER FOR REMOVING COINS FROM THE ESOPHAGUS

J. R. GILBERT, M.D., ALAMOGORDO, N. MEX.

The country doctor is often handicapped by lack of instruments. I was called to remove a nickel from the esophagus of a 2-year-old child and I had nothing in my armamentarium, nor could I find anything in those of my neighbors, with which I could remove the nickel.



Device for removing coins from the esophagus; *a*, coin.

The simple device that I thought of is to be had in any town. With an awl two small holes are made opposite each other about an inch from the end of a silk urethral bougie about Size 16 A. Some No. 30 brass spring wire is threaded into the holes, and the ends brought out at the open end of the bougie and drawn till a loop of about half an inch is left extending from the holes. With a pair of pliers the loop is now bent into a hook. The hook should extend just far enough to catch the coin.

With the patient anesthetized the instrument is introduced the same as a stomach-tube, and when it is felt to pass the coin, the operator by a sliding motion up and down the esophagus can catch the coin in a few moments. A recently boiled bougie is soft enough to yield to the coin, and it holds it in place while it is being extracted.

This is so simple and yet so efficient a device that the suggestion may be worth while to other country doctors.

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SATURDAY, AUGUST 16, 1913

SUGAR AS FOOD

In these days when newspapers and magazines are continually pouring forth a flood of popular advice about proprieties of diet to a hungry audience that eagerly devours anything pertaining to health, the layman finds it difficult to steer a safe course amid the innumerable "don'ts" of nutrition. Unfortunately, the hygienic preaching in the public columns is sometimes neither orthodox nor rational; and not infrequently it is tinged with the evident desire to produce a telling impression, which seems to be the fundamental aim of modern distributors of news and literature. Thus it has come about that some of the articles of food which entered into the dietary outfit of a past generation have been ruthlessly relegated to the category of alimentary poisons, while products hitherto indifferently accepted are now being clothed in the most subtle health-giving virtues. Amid the traditions of the past, the dogma and propaganda of the present, the enthusiasm of the food faddist and the indifference of a healthy majority, one scarcely knows where to turn for sane and dependable advice. From the dreaded specter of "auto-intoxication"—whatever that may signify—the seeker of dietary truths and health turns to the beneficent refuge of "sour-milk" therapy, as one illusion after another is dispelled.

In the midst of all this uncertainty shared, let us admit it, by the average physician as well as by his patient, it is a relief to find easily accessible sources of information that is as a rule satisfying, sane and dependable. We refer here in particular to the essays prepared under the supervision of the nutrition investigations of the Office of Experiment Stations in the U. S. Department of Agriculture. These valuable monographs[1] have frequently been referred to in THE JOURNAL. Unfortunately they do not receive the most appropriate distribution that they deserve, owing to their utterly misleading title of "Farmers' Bulletins" which an unkind political fate has made them endure. They are, in truth, the people's bulletins. One must go far to find a more comprehensive, unbiased and intelligently compiled account of sugar and its value as food than is presented in the latest Bulletin by Mrs. Mary Hinman Abel[2] of Baltimore.

Like meats and bread and sundry other widely used dietary articles, sugar has received its share of criticism and been charged with its quota of participation in the genesis of human ills. Out of a world's crop of more than 16 million tons of sucrose sugar (including cane-sugar and beet-sugar) the people of the United States consume nearly 82 pounds per capita. From the point of view of the energy furnished, sugar stands near the head of the list in respect to economy of cost. The fact that ten cents' worth of sugar at six cents per pound would furnish about three thousand calories, makes it evident that this carbohydrate is one of the cheapest items in the dietary. Few realize, however, that, unlike meat and bread, sugar has been a staple article of food for only a few generations; indeed, only in the last three quarters of a century has it been produced in such quantities and at such a price as to bring it into really general use. It is, accordingly, not inappropriate to inquire whether or not this extensive invasion of a comparatively new food product into the nutrition of man has justified itself in every way.

In view of the laxity which has until quite recently existed in respect to the purity of "manufactured" foods it is gratifying to know that sugars as a class, both the high and the low grades as now found on the market, are practically free from adulteration. The low price of cane-sugar, in comparison with the prices of substances that might be used for adulteration, protects the finished product from such attempts. Thus the widespread popular belief that granulated sugar is often adulterated with white sand or finely ground rock, and that pulverized sugar is commonly adulterated with starch or lime-dust, ought to be finally dispelled. Other popular fallacies entertained about sugar in its physiologic functions deserve a similar fate. It is sometimes said that sugar produces gout, though we know of no proof of such a hypothesis. Sugar-eating has been pointed to as a "cause" of diabetes, without any justification in the way of tenable evidence. Sugar is further charged with being harmful to the teeth; yet it can easily be maintained that the texture of the food-supply quite as much as its chemical make-up determines the behavior of the mouth bacteria which are made responsible for dental caries.

It needs to be borne in mind that, quite apart from its value as a food, sugar has become important as a flavor in the diet of man. This fact may at times favor an overindulgence; for unlike what pertains to more insipid types of nourishment, much of the sugar used is consumed for its agreeable flavor and not because it is recognized as a nutrient which is required to satisfy body needs. Probably one of the lessons that deserve to be widely inculcated in respect to sugar lies in the possi-

1. A list giving the titles of all Farmers' Bulletins available for distribution will be sent free on application to a member of Congress or the Secretary of Agriculture.

2. Abel, Mary H.: Sugar and its Value as Food, Farmers' Bull. 535, U. S. Dept. Agric., Washington, 1913, p. 32.

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bilities which it furnishes in the nature of a readily soluble, speedily available foodstuff; that is, we need to appreciate better the nutrient rather than the adjuvant rôle of sugar. In the diet of the undernourished the employment of larger amounts of sugars is beginning to come into vogue. If extreme sweetness is objectionable the mildly sweet milk-sugar has been used to fortify the food-intake, for example, in the "high-calorie" diet in typhoid fever.

Mrs. Abel has ascertained that about two pounds of sugar per week per person are consumed by large numbers of well-to-do families in this country, and experience attests the satisfactory utilization of such quantities. She remarks that the question of possible permanent injury from the use of fairly large amounts of sugar seems to be an open one, and certainly the extreme views which are sometimes found in popular writings do not seem to be entertained by physiologists, the consensus of opinion being that used in reasonable amounts sugar is both wholesome and nutritious. The key to the situation lies in the truth that sugar is a concentrated food, and therefore should be eaten in moderate quantities. Further, like other concentrated foods, sugar seems best fitted for assimilation by the body when supplied with other materials which dilute it or give it the necessary bulk.

THE PRESENT STATUS OF ABDERHALDEN'S SERODIAGNOSIS

In 1912 Abderhalden described a method for the serodiagnosis of pregnancy which has been discussed in these columns.[1] Having found that if foreign protein is injected into the blood or introduced parenterally, ferments for the destruction of this substance are produced, he next showed that in the blood of a pregnant animal there circulates a proteolytic ferment which causes a breaking down or cleavage of placental proteins and furthermore that there is in the blood of pregnant women proteolytic ferment or ferments for human placental tissue.

Two methods are used to show the presence of these ferments, the method of dialyzation and the optic method. The first method is carried out as follows: A membrane is used which allows peptone to pass but retains unsplit protein.[2] On one side of the membrane is placed 1 gm. of human placental tissue, which has been carefully washed and boiled in five times its volume of water repeatedly until the water no longer gives the biuret or ninhydrin reaction, thus showing that no peptone is present, and to this are added from 1.5 to 3 c.c. of the serum to be tested. The serum is obtained under strict aseptic precautions and should be secured absolutely pure without any trace of products of hemolysis. The membrane is then placed in a small vessel containing from 15 to 20 c.c. of distilled water, and this is incubated for from sixteen to twenty-four hours. The outer fluid is then tested for the presence of peptone. If any is present, it means that the placental protein has been split and we have a positive result. Abderhalden recommends the ninhydrin test as more exact and as permitting finer differentiation in colors than the biuret test.

When the optic method is used a mixture of 1 c.c. of a 10 per cent. solution of placental tissue in physiologic salt solution and of 2 c.c. of serum is placed in a small polarization tube and the initial rotation is read in the polariscope. Then the tube is placed in an incubator and the rotation determined at various intervals up to thirty-six hours. The maximum change with non-pregnant serum never exceeds 0.03 degree, while pregnant serum gives a change in rotation from 0.05 to 0.2 degree.

The observation by Abderhalden that the serum of pregnant women splits up human placental protein has been confirmed by numerous observers in what appears to be more than two thousand cases.[3]

Most of the authors cited have obtained positive results in practically all cases of pregnancy. On the other hand, less favorable results are reported by Engelhorn, Behne, and by Williams and Pearce, who assert that they have also obtained positive results in other conditions than pregnancy. They conclude therefore that "the test cannot be accepted as an accurate clinical method until it has been more thoroughly investigated and the possible sources of error corrected." It is interesting to note that Schlimpert and Hendry, who tested in all 316 cases, found at least eight or ten different errors in their earlier work which interfered with accuracy. They, as well as many others, including Abderhalden himself, emphasize the great importance of an exact technic. After numerous trials Schlimpert and Hendry obtained positive results in all of their last seventy-nine cases of pregnancy.

Lindig and later King have prepared dried extracts of placenta in sealed tubes which they believe are an improvement on Abderhalden's method of preparing and keeping the placental tissue; but Abderhalden holds that Lindig's preparations of dried placenta are untrustworthy and that all his powders after a few months will give a positive ninhydrin test.

1. A Biologic Diagnosis of Pregnancy, editorial, THE JOURNAL A. M. A., May 25, 1912, p. 1604. The Blood Test for Pregnancy, editorial, ibid., Dec. 7, 1912, p. 2073.

2. The preparation, method of testing, and other steps are given in detail by Judd, Charles C. W.: The Serum Diagnosis of Pregnancy, THE JOURNAL A. M. A., June 21, 1913, p. 1947, and by Schwarz: Interstate Med. Jour., 1913, xx, 195.

3. Abderhalden: München. med. Wchnschr., 1912, lix, 1305; 1912, lix, 1939; 1912, lix, 2172; Deutsch. med. Wchnschr., 1912, xxxviii, 2160; 1912, xxxviii, 2252; Ztschr. f. physiol. Chem., 1912, lxxvii, 249.
Schiff: München. med. Wchnschr., 1913, lx, 1197.
Epstein: Wien. klin. Wchnschr., 1913, xxvi, 649.
Schlimpert and Hendry: München. med. Wchnschr., 1913, lx, 681.
Jonas: Deutsch. med. Wchnschr., 1913, xxxix, 1099.
Heimann: München. med. Wchnschr., 1913, lx, 915.
Henkel: Arch. f. Gynäk., 1913, lxxix, 56.
Veit: Ztschr. f. Geburtsh. u. Gynäk., 1912, lxxii, 463.
Markus and Münzer: Berl. klin. Wchnschr., 1913, l, 776.
McCord: Surg., Gynec. and Obst., 1913, xvi, 418.
Williams and Pearce: Surg., Gynec. and Obst., 1913, xvi, 411.
Behne: Zentralbl. f. Gynäk., 1913, No. 17.
Ekler: Wien. klin. Wchnschr., 1913, No. 18.
Wegener: München. med. Wchnschr., 1913, lx, 1197.
Fauser: Deutsch. med. Wchnschr., 1913, xxxix, 304; 1912, xxxviii, 2446.
Engelhorn: München. med. Wchnschr., 1913, lx, 587.
Lindig: München. med. Wchnschr., 1913, lx, 288.
Franz and Jahrisch: Wien. klin. Wchnschr., 1912, xxv, 1441.
King: München. med. Wchnschr., 1913, lx, 1198.

We must conclude then that so far as pregnancy is concerned we have here a method of diagnosis of practical value and wide applicability. The results at hand show that the ferment is present in the blood from the sixth week after the last menstruation until the end of the third week post partum. Experiments on animals have shown that the reaction may be obtained within twenty-four hours after implantation of an ovum. The ferment is present also in case of extra-uterine pregnancy.

This method of diagnosis has an even wider application. Besides hypersecretion and hyposecretion of ductless and other glands we may conceive also of a secretion of unfinished or morbid substances from the glands, which may act as foreign materials against which ferments are produced which split them up. In dementia praecox Fauser says that there is a ferment which breaks up substances from the genital gland. The genital glands of old men and women as well as those of patients with dementia praecox serve as test objects, but there is no reaction with ovarian tissue and serum from male patients or with testicular tissue and serum from female patients. In a few instances thyroid tissue is split up. More recently Wegener[4] has reported the results of a study of two hundred cases of different nervous diseases. In dementia praecox in women he found that the serum would split up ovarian and tube tissue but not testicular tissue. The reverse was true for men. In some instances lymph-node substance was also affected. In maniacal depressive insanity proteolytic ferments could not be demonstrated in the serum, thus indicating that the test may serve as an aid in differential diagnosis. In epilepsy Wegener found that the serum would cause a cleavage of brain substance only in those cases in which dementia was present. In all syphilitic and parasyphilitic disorders he found that the serum caused cleavage of brain substance but not that of other organs. In a case of neuritis he found that the blood-serum reacted with muscle substance but not with other organs.

Lampé and Papozolu[5] tested the serum of thirty normal persons with various organs and obtained no evidences of splitting of proteins.

Frank and Rosenthal[6] attempted to determine what relationship, if any, existed between these ferments and immune bodies. They found that the latter are present when the former are absent, and hence no relationship could be traced.

Münzer suggests that the cerebrospinal fluid should be examined for foreign elements, as brain substance in dementia praecox and general paralysis.

The possibilities indicated seem large. Almost daily new observations are recorded and there is good reason to believe that real additions to our knowledge of many diseases will result from the use of Abderhalden's method.

4. Wegener: München. med. Wchnschr., 1913, lx, 1197.
5. Lampé and Papozolu: München. med. Wchnschr., 1913, lx, 1423.
6. Frank and Rosenthal: München. med. Wchnschr., 1913, lx, 1425.

SOME UNDERLYING FACTS REGARDING LIME THERAPY

It is more than probable that the salts of calcium deserve first place among components of living tissues in respect to their wide-spread distribution in the animal economy as well as to the quantity in which they occur. There is not an organism, tissue, cell or secretion in which the element calcium is missing. The lime-salts play both active and passive parts, now functioning as the inert framework of some structure like the skeleton or, again, participating in important biologic reactions. It is a truism that calcium is necessary for the growing individual—as essential, indeed, as any other single element. The characteristic diseased conditions, such as osteoporosis, associated with the deficiency of calcium in the dietary of the developing organism are definite and determinable. It seems likely, furthermore, that even the fully grown individual requires a certain minimum of calcium if nutritive equilibrium and health are permanently to be maintained. There are inevitable losses of lime in the excretions; and if it plays a conspicuous rôle in important functions such as the irritability of muscle and nerve, the coagulability of the blood and the maintenance of a "physiologically balanced" nutrient medium which bathes the tissues, calcium must be replaced when necessary. The therapeutist and the dietitian, on whom devolves the duty of correcting deficiencies in the body's intake and of introducing essential compounds, are interested in knowing whether and, if so, to what extent ingested lime-salts actually enter the circulation and take part in the metabolism.

The possibility of successfully feeding lime-salts to growing individuals is now undisputed. There is abundant evidence of calcium absorption in these cases, even when the element is administered in a comparatively insoluble form. When, however, one seeks for the demonstration of actual absorption of inorganic lime-salts by the adult there is mostly a confusion of testimony. Nor is the demonstration an easy one; for it must be recalled that calcium may be both absorbed and excreted by the bowel, so that only careful balances of intake and output over longer periods can give a final answer as to whether or not the actual store of lime has been enriched.

The lack of adequate knowledge in this field has been a serious defect in relation to the intelligent therapeutic use of lime-salts. They are freely administered with the intent of improving coagulability of the blood, of relieving urticarias, of acting on the sympathetic system, of promoting phagocytosis and of accomplishing a dozen other ends—all without the slightest evidence that a single milligram actually traverses the intestinal wall and enters the blood-stream for distribution. Clinicians have treated hemophilia and aneurysm with lime on the hypothesis of absorption, but without a scintilla of proof. For this reason we welcome evidence of a positive and convincing nature, such as has lately been

offered by Voorhoeve[1] of the University Clinic in Amsterdam. He has found it possible to promote a retention of lime even in normal well-fed adults, by administration of calcium lactate in addition to the dietary. This could be continued for more than merely brief transitory periods. The ingestion of liberal amounts of either the lactate or the chlorid of calcium was followed by an actual significant increase in the content of calcium in the blood itself.[2] The higher level thus attained may persist for weeks and even after the use of the calcium salt is discontinued. Liberal dosages, by which are meant portions of several grams, are necessary to produce striking results; but no untoward results have been observed. Many possibilities have loomed up of late in respect to the use of calcium in therapy. The first rational step in applying them consists in learning the fate of the drug administered. Satisfactory beginnings in this direction have at length begun to be reported.

THE USEFUL SIMIAN

Scientists fear the extinction of the gorilla, chimpanzee, orang and gibbon within a century unless some means be taken to prevent it. The study of these anthropoids has proved so valuable that their extinction would be a loss to science and to medicine. Hence it is proposed to establish an experiment station in the Canary Islands within easy reach of European capitals and in a climate ideal for anthropoids. The "primates" could be transported thither from Africa, to live unmolested, except by investigators, and to propagate their species to be used for the enlightenment of future generations. It is purposed to make these creatures useful in experimental psychology—to study their phonation, gesture, comprehension of spoken language, enumeration, color perception, the educational possibilities of the hand, and other phenomena. Besides, all other branches of biologic study are contemplated—breeding, crossing experiments, the problem of the evolutional relationship between anthropoids and man, the hypothesis of a double origin of modern mankind, and the like; not neglecting the belief universal among savages (which would argue the existence of simian traits at present unknown to civilization) that the anthropoids dwelling with them are not brutes, but men like themselves.

In a very material way, indeed, the "primates" have been useful to man; they have helped greatly to settle the important question first propounded more than a decade ago, whether or not bovine tuberculosis is transmissible to human beings. By feeding and by inoculation with the bovine tubercle bacillus this disease has been produced in apes. It was easily proved, of course, that the bacillus of human tuberculosis would develop consumption in the lower animals; but to prove the converse was obviously not so easy.

1. Voorhoeve, N.: Einfluss grosser Kalkgaben auf die Kalkbilanz, Deutsch. Arch. f. klin. Med., 1913, cx, 461.
2. Voorhoeve, N.: Beiträge zum Kalkstoffwechsel, Biochem. Ztschr., 1911, xxxii, 394.

Indeed, Metchnikoff and his colleagues at the Pasteur Institute in Paris have demonstrated a whole series of diseases which are common to man and the anthropoid apes, but which attack no other animal; and they have proved that protective and curative serums can be produced by experimentation on these apes. There is certainly a profound resemblance in the body chemistry; and there are also biologic similarities no less striking than the anatomic ones which are so uncannily obvious.

When a rabbit is injected with the blood of another species, there develops in its blood-serum a substance which will precipitate the blood-serum of that particular species and no other. Thus, if the blood of man has been injected into the rabbit, its blood-serum will precipitate the blood-serum of man but not that of the dog or cat. This test, which has gained an established position in medical jurisprudence, confirms the near relation of the anthropoid apes to man by the fact that it does not distinguish the blood of one from the other.

Current Comment

HEALTH OF EMPLOYEES AND INDUSTRIAL EFFICIENCY

The health of the worker is an essential element in the problem of industrial efficiency. From the point of view of the employer this should be considered, if in no other way, at least as an economic question. Failure of the captains of industry to recognize and act on this fact is a reflection on their capability as managers of great enterprises. Recently the importance of the welfare of workers has been pretty generally recognized among the employers of labor in an awakening not altogether selfish, it is believed; and the efforts made by employers to improve conditions are most gratifying. An interesting record of measures and methods adopted by a number of great enterprises in Chicago to attain greater efficiency and to safeguard and improve health conditions among employees is found in a special number[1] of the *Bulletin of the Chicago Tuberculosis Institute*. This private philanthropic organization in 1911, in pursuance of the purpose of its organization, considered a plan for the early detection of tuberculosis among employees and appointed a special committee on factories, which marked the beginning of a systematic campaign for the medical examination of employees in Chicago. Emphasis was at first laid on the detection of tuberculosis, but later the campaign was extended to the general medical examination of employees for any causes of deterioration in health and efficiency, and a definite scheme for the examination for tuberculosis as well as an outline of a method for the general medical examination of workers was prepared by the factory committee. Efforts to enlist the employers of labor in the plan met gratifying response, and through conferences between the committee and lay and medical representatives of individual companies increasing interest in the subject has been created. The *Bulletin* contains articles by the medical chiefs of seven large employing concerns in

1. Sachs, Theodore B., and others: Medical Examination of Employees, Bull. Chicago Tuberc. Inst., June 1, 1913.

Chicago setting forth the organization, plans and methods of each in securing greater health efficiency among employees and giving a summary of the results so far attained. Among the companies represented in these articles are two large mail-order houses, an agricultural implement factory, one of the packing companies, a telephone company, a lighting company and a railway company. The experience of these representative companies constitutes an interesting record and may serve as an example and a guide to other industries in the development of efficiency through improved health conditions among the workers.

PEPTAMINS

The successful synthetic production of compounds of the epinephrin type, the discovery of the occasional formation, within the body, of amins derived from the amino-acid disintegration fragments of proteins, and the demonstration that many of these can induce very decided physiologic effects, have given a new impetus to the investigation of the pharmacologic possibilities of new compounds in this field. Accordingly, we now meet the names tyramin, histamin, etc., as abbreviations for the amins formed from such amino-acids as tyrosin and histidin. In general it may be said that they exert a marked effect on unstriated muscle of the involuntary type. To these interesting compounds, which are actually known to arise at times through bacterial activity in the alimentary tract, a related type of synthetic products has lately been added under the designation of peptamins,[1] to distinguish them from the less complex forms described before. Precisely as tyramin (para-oxyphenylethylamin) is related to tyrosin (para-oxyphenylalanin [alanin is aminopropionic acid]), so the newer amins are derived from polypeptids instead of simple amino-acids. Those already reported on are the glycyl-oxyphenylethylamin, alanyl-oxyphenylethylamin and glycyl-beta-imidazolylethylamin—all prepared by the union of amino-acids with the already familiar amins. Like the latter they also exhibit a peripheral action on unstriped muscle, as it is found in the blood-vessels, intestines and uterus, for example. From the point of view of dosage the effects of the new derivatives are distinctly less pronounced, however. These new syntheses and observations are an interesting step in the physiologic and pharmacologic study of the amins in general, which has now become a most timely topic.

STATE EXAMINING BOARDS AND MEDICAL CURRICULUMS

For many years the seriously overcrowded condition of the medical curriculum has been clearly recognized. Not only was it essential to have a revision of the subjects included in the curriculum and a readjustment in the number of hours allotted to each, but it was also highly important that there should be a considerable reduction in the total number of hours. With these objects in view, in 1908 the Council on Medical Education appointed a special committee of one hundred leading medical educators, who, with thirty or more collaborators, made a thorough study of the problem. In 1909 this special committee reported a "model medical curriculum," including the suggestion that the total for the four years be kept between 3,600 and 4,000 hours. A similar study was made by a committee of the Association of American Medical Colleges, and that committee made a similar recommendation. In spite of the careful work and the recommendations made by these committees, however, state board rulings and medical practice acts are being adopted demanding that students be required to complete an excessive amount of class-room work. Last year the licensing board of Pennsylvania announced that, in order to be recognized by that body, medical colleges must require at least thirty-five hours of class-room work each week for thirty-two weeks, a total in the four years of 4,480 hours. And now California's new practice act requires that the student must have completed 4,800 hours of work in the four years! With that quantity of work, how is the student to find time to eat and sleep, let alone to think and to digest what he studies? It is quite as impossible to develop thoroughly qualified physicians by exacting a maximum amount of class-room work as it is to develop strong, able-bodied men by forcing them to partake each day of an excessive amount of food. It is as essential that intellectual food, as it is that physical food, be limited to the quantity that can be assimilated and digested. Furthermore, with the rapid advancement of medical research in our medical schools it is highly important that the student should have time to devote to such work. It is hoped, therefore, that all the agencies having in charge the matters pertaining to medical education will act in harmony regarding the proper quality and quantity of work making up the medical curriculum.

THE ALLEGED CONTAMINATION OF MORPHIN WITH APOMORPHIN

The alkaloid apomorphin, characterized by unusual properties as an emetic, is prepared by the action of mineral acids on morphin. Probably this accounts for the idea held by many that the nausea and vomiting which may attend the administration of morphin may to a greater or less degree be due to the presence of contaminating apomorphin. It has been the clinician rather than the chemist who is responsible for the circulated belief that apomorphin may be formed when solutions of morphin are heated or the alkaloid is kept in solution for any length of time. In some places it is an inherited notion that old solutions of the opium alkaloids are likely to develop apomorphin. Feinberg[1] of Zürich has tested the possibilities of a transformation of morphin in the various ways commonly ascribed as responsible for the alleged appearance of the emetic apomorphin. His chemically controlled experiments make clear that this change cannot be demonstrated even after long-continued boiling of morphin itself or morphin hydrochlorid or morphin-containing fluids. Nor does the change manifest itself in the presence of nutrient substances which serve as mediums for the growth of micro-organisms. This long-supported conception can therefore safely be eliminated from consideration in the practical use of morphin products.

1. Guggenheim, M.: Proteinogene Amine, Therapeut. Monatsh., 1913, xxxvii; Biochem. Ztschr., 1913, ii, 369

1. Feinberg, M.: Beiträge zur Kenntnis des Apomorphins, Ztschr. f. physiol. Chem., 1913, lxxxiv, 363.

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Medical News

CALIFORNIA

Office Building Planned.—Plans are said to be near completion for the erection of a twelve-story office building for the use of the Los Angeles Medical Association and physicians of the city.

Exposition Emergency Hospital.—Space in the Service Building, at the foot of Fillmore Street, has been reserved for the Emergency Hospital for the exposition at San Francisco in 1915.

Malicious Charges Defeated.—Dr. B. J. O'Neill, president of the San Diego Board of Health, and Dr. Francis H. Mead, the health officer of the City of San Diego, were charged by a disgruntled milkman, the former with having tried over the telephone to obtain milk free of cost as president of the Board of Health, the latter with having received milk and cream without charge. The milkman in question had been forbidden by the board to label and advertise his milk as "Certified" and subsequently "Pasteurized" which it was not. Neither physician had any difficulty in proving that these charges were purely malicious and did not rest on any particle of evidence in an inquiry which they both demanded before the mayor.

ILLINOIS

Plan for County Hospital.—At a recent meeting of the Douglas County Medical Society a movement was started to build a county hospital. The plan is to solicit subscriptions to the amount of about $25,000 among the residents of the county, and with this amount to establish a hospital at Tuscola.

De Kalb Sanatorium.—A massmeeting was held at the Kishwaukee Country Club under the auspices of the De Kalb County Medical Association to inaugurate measures for the establishment of a county sanatorium for tuberculosis. Dr. W. A. Evans, Chicago, delivered the address and steps were taken for the organization of a society to take the matter in charge.

Personal.—Dr. Frank P. Norbury, alienist of the State Board of Administration, has resigned to take effect September 30. Dr. Norbury will engage in practice in Springfield. ——Dr. John F. Taylor, Buda, who suffered from sunstroke while driving his automobile near Buda, lost control of his car which was wrecked, and in the wreck Dr. Taylor sustained serious injuries.——Dr. H. G. Hardt, superintendent of the Lincoln State Colony and School, has resigned to take effect August 10. He will locate for practice in Chicago.—— Dr. George Thomas Palmer, superintendent of health of Springfield, has resigned.——Dr. Thomas H. Leonard, Lincoln, has been appointed superintendent of the Lincoln State School and Colony.——Dr. and Mrs. R. H. Good, River Forest; Dr. J. F. Percy, Galesburg; Dr. George N. Kreider, Springfield, and Dr. Carroll B. Welton and family, Peoria, have sailed for Europe.——Dr. T. H. Culhane has been appointed a member of the State Civil Service Commission.——Dr. A. T. Davis, St. Charles, was operated on for appendicitis in St. Joseph's Hospital, Elgin, July 24.——Dr. J. E. Inskeep, Mount Carmel, announces that he intends to retire from active practice to establish business in the West.

Chicago

Personal.—Dr. George G. Davis, instructor in surgery at Rush Medical College, has obtained leave of absence for one year and sailed for Manila August 12, where he will serve as associate professor of surgery in the University of the Philippines.——Dr. and Mrs. Joseph Krost and Drs. Robert Sonnenschein and Julius B. Beck have sailed for Europe.—— Dr. Anna Dwyer has been appointed a member of the State Charities Commission.——At the sixtieth annual commencement of the University of Michigan, Ann Arbor, the following honorary degrees were conferred on Chicago physicians: D.Sc., Dr. Ludvig Hektoen; M.A., Dr. Bertha Van Hoosen.

INDIANA

Personal.—Dr. Warren S. Williams has resigned as a member of the Kendallville Board of Health.——Drs. Carl L. Souder and Ernest V. Nolt were seriously injured as the result of an automobile accident near Columbia City, July 3.

New County Asylums Ordered.—At the quarterly meeting of the State Board of Charities in Indianapolis, July 29, the construction of a new asylum for the Fayette County Poor Farm was recommended and plans for an addition and improvement to the La Porte County Poor Asylum to cost about $25,000 were approved. During the quarter ended July 19, twenty-six maternity hospitals were licensed by the board, twenty-four boarding homes for children, one boarding house for infants and one placing agency.

KANSAS

Personal.—Dr. Francis A. Carmichael, Goodland, has been appointed superintendent of the State Hospital at Osawatomie.——Dr. William W. Minick, formerly mayor of Wichita, has resumed the practice of medicine.——Dr. George L. A. Hamilton, Kansas City, has been appointed interpreter and a member of the medical staff of the Bureau of Immigration, New York City.——Dr. Samuel J. Crumbine, Topeka, secretary of the State Board of Health, underwent operation in Cleveland, July 18, and is reported to be doing well.

State Sanatorium Located.—It has been decided to locate the Kansas Tuberculosis Sanatorium about three miles east of Norton. Under the law which appropriated $49,500 for the sanatorium and its operation, it is provided that one hundred and sixty acres be given to the state. One large building will be erected as the administration building and residence of the superintendent and the other buildings will be small cottages or shacks with large porches. It is expected that the sanatorium will be ready to receive patients by the first of the year.

KENTUCKY

Surgical Department of Hospital Opened.—The surgical department of the W. W. Massie Memorial Hospital, Lexington, was opened for the reception of patients, July 19.

New Officers.—Tri-County Medical Society (Warren, Simpson and Logan), at Franklin, July 18: president, Dr. Wm. A. Guthrie, Franklin; secretary, Dr. John H. Blackburn, Bowling Green (reelected).

Personal.—Dr. Joseph W. Irwin, Louisville, has left for Europe.——Dr. S. L. Tabb, Elizabethtown, fell August 1, fracturing his right leg below the knee.——Dr. James A. Southall, Hopkinsville, was thrown from his buggy August 29 and injured his spine.——Dr. Gaylord C. Hall, Louisville, who was operated on recently for appendicitis at St. Anthony's Hospital, is reported to be improving.——Dr. Frank A. Taylor, Somerset, was thrown from his horse recently, fracturing his leg and necessitating the amputation of the right foot above the ankle.——Dr. L. S. McMurtry, Louisville, has sailed for Europe.——Dr. and Mrs. Joseph M. Matthews, Louisville, are making an extended visit on the Pacific Coast.——The office of Dr. I. D. Winston, Sturgis, was burned July 6.

MARYLAND

Tuberculosis Hospital Completed.—The Allegheny County Tuberculosis Sanatorium on Haystack Mountain near Cumberland, is practically completed and is expected to be ready to receive patients this month.

Fahrney Reunion.—The ninth annual reunion of the descendents of Dr. Peter Fahrney was held at San Mar, near Boonesboro, July 28. About two hundred members of the family were present from Maryland, Pennsylvania and the Virginias and elsewhere, and addresses were made by Drs. Peter Fahrney, Hagerstown, and O. A. Highbager, Waynesboro, Pa. It was decided to erect a monument to Dr. Fahrney at Fahrney's Church.

Baltimore

Personal.—Dr. Henry G. Branham was operated on at the Franklin Square Hospital, July 31, for disease of the intestine and is reported to be doing well.——Dr. James J. Mills sailed for Antwerp recently.

Extension of Dispensary.—Work has been commenced on the extension of the Johns Hopkins Hospital Dispensary. The building to be added includes a laboratory and twelve examining rooms and will be 100 by 18 feet and one story in height. One story is also to be added to the pathologic building to allow more room for the work of this department. The improvements will cost $15,000.

MICHIGAN

Sanitary Engineer Appointed.—It is announced that the State Board of Health has decided to offer the position of state sanitary engineer to Prof. E. D. Rich of the University of Michigan.

Health Train Tours State.—The State Health Exhibition Train began its tour of the state August 4, and will be on

the road the greater part of the month. The purpose of the tour is to conduct an educational campaign in sanitary and health methods laying especial emphasis on precautions against the spread of tuberculosis.

Sanatorium Notes.—The first annual report of the Houghton County Tuberculosis Sanatorium states that since its establishment, eighty-six patients have been received in the sanatorium. Of these, eight were discharged as arrested cases, six as improved, twenty-nine unimproved and eighteen died, and there are now in the institution twenty-five patients.——The new tuberculosis hospital for the city and county of Kalamazoo, erected at a cost of $40,000, is nearly ready.

MINNESOTA

Roof Garden Sanatorium for Children.—A roof hospital for tubercular children has been established on the roof of the Minneapolis City Hospital with accommodation for forty children.

Personal.—Dr. Edward W. Buckley, St. Paul, has been reelected supreme physician of the Knights of Columbus.——Dr. A. B. Ancker, for thirty years superintendent of the city and county hospital of St. Paul, was given a surprise reception by nurses and interns, August 1.——Dr. Robinson Bosworth has been elected executive surgeon of the Minnesota Association for the Prevention and Relief of Tuberculosis.——Dr. Ernest B. Hoag, special director of school hygiene for the Minnesota State Board of Health, has finished his work and expects to return to his home in California.——Dr. Frank Smithies, Rochester, has resigned as gastroenterologist in the Mayo clinic to become a member of the faculty of the Medical School of the University of Minnesota, Minneapolis.

NEW MEXICO

Low Grade Colleges Not Recognized.—At a recent meeting of the New Mexico Board of Medical Examiners a rule was adopted that hereafter diplomas granted by colleges listed in Class C by the Council on Medical Education of the American Medical Association will not be recognized by that board.

Personal.—Dr. L. K. Warren, Cloud Croft, fractured his leg just above the ankle in a runaway accident, recently.——Judge Leahy has given a judgment for $9,000 in favor of Dr. Harry M. Smith against the board of trustees of the New Mexico Hospital for the Insane. Dr. Smith charged a violation of contract and asked damages of $15,000.

NEW YORK

Personal.—Dr. A. K. Doig, Nyack, has undergone operation for appendicitis and is at the same time suffering from blood-poisoning, the result of an infection of the thumb.——Dr. James S. Allen, Geneva, has sailed for Europe.

Tuberculosis Notes.—The Board of Supervisors of Suffolk County has decided to take title to a tract at Holtsville where it is planned to establish a county sanatorium for tuberculosis.——A cottage at Estey's Point has been secured for the Ithaca Preventorium for Tuberculosis. The property is much superior to the house previously secured on the Mecklenburg Road. It is more accessible and has a plentiful supply of pure water.——The supervisors of Cattaraugus County have voted an appropriation of $18,000 for a building and site for a county tuberculosis hospital. A site has been tentatively selected between Salamanca and Little Valley.——The supervisors of Saratoga County have appropriated $8,000 toward the erection of a county tuberculosis hospital. A site has been presented to the county in the town of Providence and the work of clearing the site and cutting timber has already been completed.——The Open Air Camp Committee of the Niagara Falls Tuberculosis Association has selected a site for the proposed day and night camp for tuberculosis on Park Avenue near the city line and the river.

New York City

Hospital to Build.—The Bronx Hospital has purchased a lot 127x105 feet facing Crotona Park, on which an eight-story hospital building will be erected at an estimated cost of $300,000. The hospital dispensary treated more than 30,000 patients last year.

East Side Baby Contest.—The baby contest held at First Avenue and Ninety-First Street on July 26 brought out 3,000 spectators and 100 babies were entered. The contest was considered such a success that it was decided to have one every Saturday for the remainder of the season.

Off for Europe.—Among those who have sailed for Europe recently are Dr. and Mrs. George Emerson Brewer, Dr. Lewis Frissel, Dr. Hugo Lange, Dr. and Mrs. William J. O'Brien, Dr. and Mrs. Calvin Thayer Adams, Dr. and Mrs. E. B. Zabriskie, Dr. and Mrs. A. D. Chaffee, Dr. and Mrs. J. M. Vancott of Brooklyn, Dr. and Mrs. E. W. Peet and Dr. Francis J. Murray.

Hospital May Close.—It has been announced that the Rockaway Beach Hospital may be compelled to close its doors for want of funds. The hospital is in debt to the amount of $40,000 and has no funds with which to meet its obligations. The hospital is non-sectarian and is crowded at the present time. A house-to-house canvass is being made in the interest of the institution.

Safety Lessons for Children.—Hitherto the instruction given children as to how to avoid street accidents has been mostly by talks and pictures, but the American Museum of Safety is now conducting a safety campaign in vacation schools and recreation centers in Brooklyn where the instruction includes an object lesson to each child in safety. The pupils are taught the correct way to board and alight from a trolley car and how to cross a street in the safest way. Girls are taught how to get on and off a car with a doll or bundle in one arm.

Personal.—Dr. Attillo Caccini has been ordered to report to the Italian Foreign Office in Rome with a view to his representing Italy on the international commission which has in charge the sanitation of the city of Jerusalem. Dr. Caccini sailed for Europe July 30.——Dr. Charles Brush, ambulance surgeon of St. Vincent's Hospital, New Brighton, S. I., suffered a fracture of the arm and lacerations of the face and scalp in a collision between the ambulance and a trolley car, July 30.——Dr. Charles Hermann Reinsberg was stricken with heart disease while on a surface car recently and was taken to the Knickerbocker Hospital where it was said that his condition was precarious.

The City to Sell Ice.—New York is about to take its second step in paternalism. The first step was that of maintaining twenty-nine milk stations where milk can be bought at cost price and now in connection with these stations ice will be sold at cost. The city is preparing to establish an ice plant. It is planned to use the exhaust steam beneath the Hall of Records for the purpose of running the machinery for manufacturing ice. The estimates furnished show that ice can be produced by the city at a cost of $2.50 per ton, for which, under the present conditions, the consumer pays eight or nine dollars a ton. It is believed that by bringing ice within the reach of tenement dwellers the public health during the heated season will be greatly benefited.

NORTH CAROLINA

New Bulletin.—The Fourth District Medical Society of the State of North Carolina has commenced the publication of a monthly bulletin in charge of Dr. William H. Smith, Goldsboro, president, and Dr. Michael M. Saliba, Wilson, secretary of the organization.

Personal.—Dr. W. I. Royster, Raleigh, sustained serious injuries by being knocked down by an automobile recently.——Dr. Wade H. Brown, professor of pathology in the University of North Carolina, Chapel Hill, has resigned, to accept service with the Rockefeller Institute of Medical Research, New York City, and has been succeeded by Dr. James A. Bullitt, late of the University of Mississippi.

OHIO

Plan Enlargement of District.—The trustees of the Lima District Tuberculosis Hospital which includes Allen, Mercer, Auglaize, Shelby and Van Wert counties reports that the district shall be enlarged by the addition of Hardin, Hancock, Logan, Putnam or Paulding county, under the amendment passed by the last legislature, allowing ten counties to a district.

Personal.—Dr. John R. Johnson, Lima, has succeeded Dr. John W. Costolo as superintendent of the Lima District Tuberculosis Hospital.——Dr. John W. Beebout, Dexter City, was seriously injured and may lose the sight of both eyes as the result of an explosion of a bottle of chloroform, August 6.——Dr. M. E. Coy, Dayton, who was operated on for appendicitis July 29, is reported to be convalescent.——Dr. John S. Pyle, Toledo, has gone abroad.——Dr. Sherman McKenney, assistant physician at the State Penitentiary, has resigned and will locate in Levering.——Dr. W. H. Burns, health officer of Reliance, is reported to be seriously ill with septicemia, due to an infected wound.

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PENNSYLVANIA

New Officers.—Fifth Censorial District Medical Society at York, July 24: president, Dr. George E. Holtzapple; secretary-treasurer, Dr. Charles W. Eisenhower, both of York.

The White Haven Sanatorium Association has the task of raising for the current fiscal year $25,000 needed for free beds for consumptives too sick to leave Philadelphia and too poor to be cared for at home; and to help pay board of patients at White Haven.

Assistants in Labor Department.—On August 6, Commissioner of Labor and Industry, J. P. Jackson, announced the appointment of Dr. John C. Price, of Scranton, as chief medical inspector of the new department. Dr. Walter H. Blakeslee of Philadelphia is also appointed to the work of medical inspection, pending the further organization of the department.

Personal.—Dr. Daniel S. Rice is reported to be ill at his home in Hastings.——Dr. Charles B. Reitz, Rochester, N. Y., has been elected pathologist at the Rittersville State Hospital.——Dr. Ralph C. Kell, physician of the department of the insane, Embreeville, has resigned.——Dr. C. B. Jones, Summerhill, who was seriously injured by an electric shock several weeks ago, is making slow progress toward recovery.

Philadelphia

No Pier Hospital for Consumptives.—Although every effort to find a suitable pier for the use of consumptives as a day camp has been made and $1,300 has been collected from charitable persons to aid in the work, the tuberculosis dispensaries of this city have been obliged to abandon the project for this summer and the money has been returned.

City to Enforce Garbage Rules.—A rigid investigation of the complaints of citizens of the inefficient collection of garbage, substantiated by fines of $1,766 imposed by the city on the company in the month of July will be made by the chief of the Highway Bureau. A campaign has also been started against householders who have not provided metal lids for garbage cans.

Eye Dispensary Branch to be Opened in School.—A branch of the Eye Dispensary of the Department of Public Health and Charities for the examination and treatment of the eyes of school children has been established at the Southwark School at Ninth and Mifflin streets, and will be in operation when the schools open in the fall. Dr. William J. Ryan has volunteered to do the work.

Child Hygiene Association Seeks Charter.—Application has been made for a charter for the Child Hygiene Association, under the name of the Child Federation. It is the intention of physicians who are directing the work, to extend it throughout the city, forming branches in various localities under the control of a central organization. The main object will be to reduce infant mortality through educational propaganda, to take the form of neighborhood shows, demonstrations and meetings.

GENERAL

Godlee Will Confer Degrees.—Sir Rickman Godlee, president of the Royal College of Surgeons, has accepted the invitation to confer the fellowships of the American College of Surgeons at the first convocation of the institution which is to be held in Chicago, November 13. At this time it is stated that more than twelve hundred surgeons of the United States and Canada will receive fellowships.

Personal.—The University of Michigan conferred on Surgeon-General Rupert Blue, U. S. P. H. S., the degree of Doctor of Public Health at its recent commencement.—— The position of associate professor of surgery in the Medical Department of the University of the Philippines formerly held by Dr. John R. McDill, who, as already announced, has returned to the United States, has been filled by the appointment of Dr. George G. Davis, Chicago, who has taken the place for one year.

Congress on School Hygiene.—The formal program of the Fourth International Congress on School Hygiene will open in Buffalo August 25. On the preceding day, Sunday, the pulpits of the Buffalo churches will be occupied by distinguished speakers who are delegates to the congress. Much popular interest has been manifested in the coming congress, and an array of over three hundred speakers has been provided, who will speak or read papers on every conceivable subject relating to the hygiene of school life and closely allied subjects. Abundant provision has been made by the people of Buffalo for perfect arrangements for the congress and for the entertainment of delegates, guests and visitors to the meeting. The opening meeting, August 25, is to be held at Elmwood Music Hall at 10:30 a. m. and the regular sessions at the City Hall at 9 a. m. and 2 p. m. daily, and evening sessions at 8 at Elmwood Music Hall. Registration headquarters will be at the Hotel Iroquois, and the scientific and commercial exhibits in the Auditorium on Broadway. This is one of the most important international congresses of recent years and a large attendance is expected.

FOREIGN

Quadricentennial of Eustachius.—The town of Sanseverino in Italy invites the members of the profession to a celebration in honor of the quadricentenary of Bartolomeo Eustachio, the Italian anatomist of the sixteenth century. A marble tablet will be unveiled and the occasion celebrated with a scientific regional medical congress, September 6-25.

Honors to Prevost.—Prof. J. L. Prevost of Geneva was given an ovation recently on the occasion of his reaching the time limit of age and giving up the chair of physiology which he has so long filled. Delegates from medical societies and universities were present from France, Italy and other countries, and several decorations and degrees were conferred on him. He was one of the founders of the *Revue Médicale de la Suisse Romande*, now in its thirty-third year, and has been constantly on the editorial staff.

CANADA

Public Health Association to Meet.—The third annual meeting of the Canadian Public Health Association will be held in Regina, Sask., September 18-20, under the presidency of Dr. John W. S. McCullough, Toronto.

New Hospital.—The Provincial Royal Jubilee Hospital, Victoria, expects to construct a $400,000 hospital building to take place of the present building which accommodates one hundred and fifty patients. Competitive prices have been offered for the construction of plans.

Personal. — Dr. Helen MacMurchy, Toronto, has been appointed assistant inspector of hospitals and public charities in Ontario, and will have special supervision over the feeble-minded.——Dr. Chas. J. Hastings, M.O.H., Toronto, has been elected president of the Ontario Health Officers' Association. ——Dr. James Algernon Temple, formerly dean of Trinity Medical College, and for many years a prominent teacher of obstetrics and gynecology in the University of Toronto, has been honored with the degree of LL.D. by his alma mater, McGill University.——Dr. John Stewart, Halifax, N. S., has gone to Edinburgh to receive the honorary degree of Doctor of Laws.——Dr. Walter Bapty, Victoria, has been appointed inspector of hospitals for British Columbia.——Dr. N. E. McKay has resigned from the chair of surgery in Dalhousie University, Halifax, N. S.——Dr. A. C. Sinclair, Vancouver, has been appointed superintendent of the Winnipeg General Hospital.

Opening of New Toronto General Hospital.—On June 19, the new Toronto General Hospital was opened with appropriate ceremonies by the Lieutenant-Governor, Sir John Gibson, Mr. J. W. Flavelle, chairman of the Board of Trustees, occupying the chair. Mr. Flavelle sketched the history of the hospital from the year 1818. The old building on Gerrard Street, which has been occupied for seventy years is abandoned and now offered for sale. To make possible the new institution, an out-patient department, costing $100,000, was contributed by Mr. Cawthra Mulock; the Massey Estate contributed a similar sum; Senator George A. Cox and his family contributed the nurses' home; Mr. J. C. Eaton, the surgical wing, costing over $300,000, and a further recent subscription of $50,000; the Misses Shields, $140,000 for the Emergency Hospital; the Ontario Government, $300,000 on behalf of the University of Toronto for the Pathologic Department; the city of Toronto, $200,000; numerous smaller private contributions. Just prior to the opening the city gave an additional $210,000 and private subscriptions were secured amounting to $300,000, leaving a balance of the total of $3,000,000 yet to be secured, of $300,000. In the out-patient department it will be possible to treat 600 patients a day. Six wards in the surgical building will accommodate 120 patients; there is a similar arrangement in the medical wing. In the administration building there are thirty-six beds for semi-public patients on the main floor; on the second are public wards for forty-four patients for eye, ear, nose and throat cases; on the third floor are forty beds for gynecological cases; on the top floor, intern quarters, to be used for private patients until the separate private patients' building is completed. The

medical wing has in addition thirty-six beds for purposes of classification, also a large hall for demonstration purposes. On each of the three floors of the surgical wing are complete operating suites. Apart from the main building and behind the surgical wing is the Nurses' Home, in every respect designed for the comfort of the occupants. In connection with this there are gardens and a tennis court. The Private Patients' building and Obstetrical buildings will not be ready until the fall. There is a separate building to house the servants. In every department is to be found the most modern equipment. Wide verandas and roof-gardens are conspicuous features. The buildings are so arranged that the grounds are inclosed on all sides. The vital center is in the southeast corner. Here is the power plant. All heat, artificial light and power emanates from this center.

LONDON LETTER

(From Our Regular Correspondent)

LONDON, July 26, 1913.

The Annual Meeting of the British Medical Association

The eighty-first annual meeting of the British Medical Association was opened at Brighton on July 22. As usual, it was preceded by the annual representative meeting which began on July 18. The important question of the reorganization of the association, which has been brought to a head by the insurance act, was discussed. At first formed for scientific purposes and to deal with the relation between physicians and their patients, the association is now confronted with a third party—the state—which is interfering more and more in medical matters. The defeat of the association in the struggle with the government over the insurance act has shown that the machinery of the association is antiquated. The proposal, mentioned in previous letters to THE JOURNAL, to transform the association into a trades union, was brought forward. This would enable the association to accomplish the following, which at present are beyond its powers: (1) benevolent provision for members and their families; (2) promotion of candidature for any British legislative assembly; (3) taking or defending legal proceedings on behalf of members involved in their professional capacity; (4) sale or transference of practices; (5) the provision of a fund for the support of physicians affected by actions undertaken by the association. A keen debate took place in which it was urged against the motion to form a trades union that a strike, which is the principal weapon of the unions, was impossible in the medical profession and that what was required for success was union of the profession, which did not exist at present and without which a trades union could not succeed. Moreover the intimidation on which the success of trades unions depends was considered objectionable. The motion was defeated by 11,408 to 5,259 votes. Another matter discussed was a proposal made in Parliament to give friendly societies control again over physicians. It may be remembered that the abolition of such control was one of "the six points" demanded by the association on the introduction of the insurance act and was conceded by the government. Friendly societies are now complaining that, in consequence of malingering, excessive demands are being made on their funds. They attribute this to the fact that physicians give certificates of incapacity for work too easily since they have ceased to be in the employ of societies. A strong protest against the proposal, which it was declared would be a breach of faith between Parliament and the medical profession, was carried unanimously. The government having introduced an amending act to the insurance act a number of amendments which had been drafted for the purpose of being brought before Parliament were adopted. They were as follows: 1. A charge to be made for night calls by insured persons. 2. An insured person shall not be entitled to require medical attendance from any physician other than the one on whose list he is, as for instance, for the administration of a general anesthetic. 3. An insured person shall not be entitled to medical attendance for any disease or disablement caused by his own conduct other than venereal disease. At first it was intended not to make an exception of venereal disease, but it was pointed out that its early and efficient treatment was desirable in the interest of the patient, the public and the physician. It was most undesirable that the patient should go to the pharmacist or the quack for treatment. 4. Medical benefit shall not include any right to treatment of miscarriage or abortion or any condition arising from and within twenty-eight days after it. It was decided to raise the subscription of members to the association from the present sum of 6 to 10.50. It was pointed out that the association had been hindered by lack of funds in its contest with the government and that as the result of the extra expenses in connection with holding of meetings and organizing against the insurance act the association had a deficit of 44,000 in 1912 and that there was an estimated deficit of 28,000 in 1913.

THE PRESIDENT'S ADDRESS

The president, Dr. W. Ainslie Hollis, delivered an interesting address on "The Medical History of Brighton and the Neighborhood." He traced the history of this most fashionable of health resorts from prehistoric times. Formerly a fishing village, it was "discovered" in the eighteenth century by Dr. Richard Russell, physician to St. Thomas' Hospital, who called attention to the value of sea water in a work published in Latin and entitled "Dissertatio de sabe glandulari et de usu aquae marinae in morbis glandularum." He resided in Brighton during the season and attracted a fashionable clientele. With the advent of the nineteenth century Brighton became the happy hunting ground of quacks. One Nathan Smith invented an air pump for "the extraction of the gout." Perhaps this may be regarded as a crude anticipation of Bier's treatment. During the first quarter of the nineteenth century dispensaries, sea-bathing infirmaries and hospitals were founded for the relief of the sick poor people.

THE ADDRESS IN MEDICINE

The address in medicine was delivered by Prof. George Murray, whose pioneer work in connection with the thyroid gland is so well known, on "Some Aspects of Internal Secretion in Disease." He pointed out that while typical cases of myxedema are striking, slight and early cases are easily overlooked. It was he who discovered the thyroid treatment of myxedema. He mentioned the interesting fact that his first patient is alive and well after twenty-two years, a condition of health being maintained by a dose of 10 mm. liquid thyroid extract weekly. He briefly discussed the functions of the ductless glands. The dual function of the generative glands could be separated experimentally. In the testicle the internal secretion was probably furnished by the interstitial cells. Ligature of the spermatic cord, like castration, caused arrest of development of the sexual characters but ligature of the vasa deferentia did not. Similarly, Roentgen rays arrested spermatogenesis without arresting internal secretion. He held out the hope that with advance of our knowledge of internal secretions the treatment of melasma suprarenale and hyperthyroidism and acromegalia will prove more successful.

THE ADDRESS IN SURGERY

The address in surgery was delivered by Sir Berkeley Moynihan, who took for his subject "The Gifts of Surgery to Medicine." He said that surgery in recent years had proved a powerful helpmeet, not only in the elucidation of the problems of internal medicine, but by reason of the light it had brought to bear on the functions of many of the organs of the body. The chief glory of the surgeon came from the dedication of his powers to the individual, but there was a cause also to be served. In every operation something might be learned, not only of the disorders which called urgently for relief, but of other associated or, possibly, separate conditions which chanced at the same moment to be present. Clinical research when sedulously conducted and illumined by the disclosures made on the operating table afforded the most accurate of all methods of investigation in the diseases of man.

A NATIONAL SYSTEM OF HOSPITALS

In the section of medical sociology, Professor Moore, professor of biochemistry in the University of Liverpool, opened a discussion on "Hospitals in Relation to the State, the Public and the Medical Profession." He characterized the present system as inadequate in some directions, wasteful and overlapping in others. A reformer who attempted to show how the present muddle might be mended was met with the cry that the glorious example of charity and voluntary effort must not be weakened. They already saw the beginning of a new movement in the applications made to the municipal authorities for assistance from the rates in aid of the voluntary hospitals. A similar indication was the grants from the state made to the medical schools for the education of students. The insurance act would rapidly produce an increased rate of approach toward a national system of hospitals. The old conception of the hospital as a place for the relief and palliation of disease must be replaced by the scientific realization of the hospital as the pulsating life-center of a little corps, charged with the execution of an important

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task, the maintenance of the highest degree of health in a given district and correlated to similar corps or units all over the country.

NON-DIABETIC GLYCOSURIA

In the section of medicine, Dr. A. E. Garrod opened a discussion on "Non-Diabetic Glycosuria." He said it was impossible to draw any sharp line of demarcation between diabetic and non-diabetic glycosuria. Diabetes was held to involve several distinct ideas—persistence of glycosuria throughout the remainder of life, fatality and a group of symptoms, such as polyuria, thirst, wasting and local lesions (boils, cataract and gangrene) and lastly, a profound disturbance of carbohydrate metabolism. Not one of these conceptions provided a satisfactory basis for a definition. They had no right to assume that recovery could not occur. A diabetic patient might exhibit for a long period none of the associated symptoms mentioned. Nor did diabetes due to definite visceral lesion differ in any essential from that for which there was no explanation. Lastly, if the criterion was taken to be failure to dispose of glucose in the normal way with the result that it accumulated in the blood and was excreted in the urine, very few varieties of glycosuria could be excluded from the diabetic group. The progress of research tends to show that an internal secretion of the pancreas is the dominant, if not the sole, controller of carbohydrate metabolism and that with few exceptions all varieties of glycosuria were of pancreatic origin. Although often no signs of disease could be found in the pancreas it was probable that its internal secretion was subject to control by influences working from a distance or emanating from other internal secretions.

PARIS LETTER

(From Our Regular Correspondent)

PARIS, July 25, 1913.

Hygienic Questions Involved in Using the Water of Lake Geneva to Increase the Water-Supply of Paris

The municipality of Paris is considering the means of increasing its insufficient supply of drinking-water. Out of four plans presented, only two are capable of furnishing a million cubic meters per day, and these alone could be considered. One is to bring the water from Lake Geneva, the other to bring it from the Loire Valley. It is calculated that the Lake Geneva project would cost about $160,000,000 (800,000,000 francs). To justify so great an expense, the water should be of unfailing purity. Studies made by the city of Paris show that although Lake Geneva is a perfect purifying basin in calm weather, under the action of winds and currents during storms in the autumn and winter seasons, the water rapidly becomes impure. Continuous filtration, therefore, must be provided for, and this is a very serious drawback to the plan. On this account the committee of the municipal council intends to recommend the adoption of the Loire Valley plan, which will cost less and will assure pure water, taken not from the river itself, but from its alluvia, filtered through sand. Other objections raised to the use of Lake Geneva water are that it has a slight tendency to produce goitre, and that neither filtration nor boiling could altogether check this tendency. Another danger is the risk of the introduction of the bothriocephalus, which at present is known in France only in the upper Savoy, but which is very frequent around Lake Geneva.

Enrolment in Army at the Age of Twenty

The physicians in the Senate and in the Chamber of Deputies recently met to discuss the question of enrolment in the army at the age of 20 and resolved by a vote of 25 against 5 that there were no reasons against enrolment at this age, provided that a rigorous medical examination were made at the time of recruiting the men, and that the hygienic conditions of actual service were rigidly respected, that the military education was not made too severe, that overcrowding of the barracks and hospitals be avoided, and that the clothing, food and other hygienic conditions of the soldier's life were improved. Against the advice of the superior consulting committee on military hygiene and epidemiology, and the decision of the army committee, the Chamber of Deputies adopted the age of 20 by a vote of 376 to 189.

Prizes of the Academy of Science

The Académie des sciences has awarded two Montyon prizes of $500 (2,500 francs) each, one to Mme. Lina Negri Luzani for her studies on the so-called Negri bodies, discovered by herself and her late husband in the nervous system of rabid animals; the other to Dr. L. Ambard for his "Memoir on the Renal Secretion."

The Barbier prize of $400 (2,000 francs) was shared between Drs. Jules and André Boeckel, on the one hand, for their work, "Fractures of the Cervical Spine without Medullary Symptoms," and Drs. Beurmann and Gougerot, on the other, for their volume on the sporotrichoses.

The Argut prize of $240 (1,200 francs), a new biennial prize, intended to recompense the person who made a discovery curing a disease which previously could be treated only by surgery, thereby increasing the scope of medicine, was awarded to Drs. Robert Crémieu and Claudius Regaud for their work concerning the effects of the Roentgen ray on the thymus and the treatment of the thymus by roentgenotherapy.

The Bréant prize of $20,000 (100,000 francs), intended for the discoverer of a cure for Asiatic cholera, was, of course, not awarded. Out of the interest on the fund, the academy awarded three prizes of $400 (2,000 francs), one to Dr. C. Levaditi for his work on acute epidemic poliomyelitis and acute infectious pemphigus; one to Drs. A. Netter and R. Debré for their work, "Cerebrospinal Meningitis," and one to Professor V. Babes for his treatise on rabies.

BERLIN LETTER

(From Our Regular Correspondent)

BERLIN, July 18, 1913.

The Campaign against Typhoid in Southwestern Germany

Early in 1890, when cholera invaded Germany, it was shown that provision for an unobjectionable water-supply and removal of excreta is not sufficient for the prevention and suppression of the epidemic; it was found necessary to investigate each individual case. Typhoid and cholera possess much in common with reference to their mode of spread. Robert Koch first called attention to the fact that the only source and the most dangerous transmitter of the typhoid bacillus was an infected human being, and that it was of the greatest importance to discover those ill with typhoid and the healthy carriers by bacteriologic examination and to apply to them the necessary preventive measures.

These principles were first applied in the Prussian district, Trier, where typhoid had attained remarkable prevalence. After this experimental proceeding had shown good results, it was regarded as desirable to carry out the method of Koch in the campaign against typhoid on a more extensive scale. It had been shown that this disease had spread to an alarming extent and was very firmly established not only in the Prussian district mentioned and in the neighboring Bavarian district of the Palatinate, but also in the imperial provinces of lower Alsace and Lorraine and in the Oldenburg principality, Birkenfeld. In these districts, in 1902 and 1903, by the aid of an imperial appropriation and the contribution of national funds by the states immediately concerned, an energetic, systematic campaign against typhoid, according to instructions of Robert Koch, was instituted under the common auspices of the imperial government and the governments of Prussia, Bavaria and Oldenburg, as well as the provincial authorities of Alsace and Lorraine.

The number of bacteriologic laboratories already established in Trier and Saarbrücken, which were devoted to the anti-typhoid campaign in conjunction with the medical and government authorities, was increased by nine other institutions in the principal localities of the affected territory. In order to assure a uniform practice and a regular cooperation of these stations, there was appointed in November, 1904, with the assent of the provincial authorities concerned, an imperial commissioner for the campaign against typhoid in the southwest of the empire, and Saarbrücken was assigned to him as headquarters.

For the entire work of carrying out the organization, the empire, in the period from 1903-1912, expended about $443,750 (1,775,000 marks). The success of this extensive trial was equally satisfactory with the preliminary one. While in 1904 the number of typhoid cases in the entire area amounted to eleven per 10,000 inhabitants, it had fallen by a permanent reduction to 4.8 in 1911. That is a diminution of typhoid incidence of 56.4 per cent. That this reduction is not to be attributed to a general fall in the typhoid morbidity in Germany is shown by a comparison with the statistics of Prussia. In Prussia there were in 1904, 4.3 cases of typhoid per ten thousand inhabitants and this number has maintained itself with slight variation, and indeed in 1911 it was exactly

the same. Of the numerous scientific results of this organization one of the most important was the realization of the importance of bacilli carriers who constantly eliminate the organisms.

It was first established by observation and study during the typhoid campaign in the southwest that more frequently than was previously assumed, apparently healthy people, who showed no symptoms of disease and according to their own statements have never suffered from typhoid, discharge typhoid bacilli occasionally or continuously and that both these forms of typhoid hosts, those persistently harboring and discharging virulent bacilli after recovery, and the healthy bacilli carriers, play a very dangerous rôle in the spread of typhoid. It was known that of every hundred typhoid patients from three to six continue to harbor typhoid bacilli. In addition, there are the bacilli carriers of whom it is not known that they were ever affected with the disease.

Up to the end of 1909, 501 typhoid bacilli carriers were discovered in the area under observation, that is 0.016 per cent. of the inhabitants of this district. Among these, not less than 71.9 per cent. were women. This marked participation of the female sex is probably due to the fact that among the typhoid hosts the principal location of the bacilli is the gall-bladder, and that for the same reason that women form the chief contingent of gall-bladder patients they also form a great majority of typhoid hosts.

By the discovery of typhoid hosts, an explanation has also been found for so-called typhoid houses and typhoid foci, that is, those places where almost every newcomer was immediately attacked with typhoid. It was the typhoid hosts who, as inhabitants of such houses, spread the infectious germs and as soon as the necessary preventive measures were taken with reference to these persons the occurrence of new infections was prevented. Unfortunately, no means has yet been discovered to free typhoid hosts permanently from their bacilli by medicinal means. In order to favor the solution of this question there has been offered a prize of $2,500 (10,000 marks) for an effective process, as I noted in my last letter.

Campaign against Antivaccinationists

On the bill-boards of a suburb of Berlin there was recently posted a large placard with the title "Vaccination, Disease, Death," which made a propaganda against vaccination and finally recommended the procuring of a pamphlet which had the title, "How Shall I Conduct Myself with Reference to the Demand for Vaccination?" The committee against quackery of the Berlin Aerztekammer (Medical Chamber) sent a communication to the communal authorities in which attention was directed to the very objectionable contents of the placard, and especially to the fact that by this placard and the pamphlet advertised in it the public was directly incited to disobedience to an imperial law. The communal authorities were requested to take action for removing the placard from the public placard columns. The town council immediately complied with this request and in a public statement asserted that the entire placard was suited to produce false ideas in the public mind.

Hospital for Mild Cases in Berlin

As the number of people entering the municipal hospitals is constantly growing and it is therefore to be feared that the existing hospitals will soon be insufficient, the city government of Berlin has proposed a plan for the relief of the existing hospitals by placing patients elsewhere whose condition requires care in a hospital but who are not so sick that they need the costly arrangements provided for the treatment of the severely sick.

The suitable treatment of tuberculous patients will be provided for by the establishment of an institution for the care of patients with laryngeal and pulmonary disease on the land belonging to the municipality of Berlin at Buch. In addition, an institution for convalescents and mild cases will be provided for by the remodeling of a building in the neighborhood of Berlin which was originally intended for other purposes. According to the statistics for one year, more than 18 per cent. of all the patients discharged from the municipal hospitals, amounting to about 9,500 persons who had received about 125,000 days of care, could have been treated much more cheaply in such an institution and have left vacant about 340 beds per day in the regular municipal hospitals. The city council has approved the plan of the city government and appropriated $7,500 (30,000 marks) as the first building fund. The institution to be established first will be only for men.

BUDAPEST LETTER

(From Our Occasional Correspondent)

BUDAPEST, July 17, 1913.

Methyl Alcohol

Some few years ago the medical profession was alarmed by the report that rum produced blindness, and as a consequence the valuable and tried stimulant, tea, fell into disrepute here (in Hungary, tea is drunk with rum). After a time equally bad reports came of other brandies and liquors, the sight being affected in all cases. In some instances death followed, the lethal effects being found to follow the many compounds placed on the market to give the flavor of old brandies to raw cheap spirits. Examination having been made as to the source of poisoning, it was found by Professor Telletar that the toxic agent was methyl alcohol (wood alcohol) which is manufactured in Hungary in great quantities for industrial purposes. Since that time there have been several poisonings due to methyl alcohol, which would formerly have perplexed the doctor. It was found, for instance, that even the prolonged working with paints containing methyl alcohol may cause optic atrophy simply by the evaporation of the spirit. In a cabinet-making factory, where methyl alcohol is used almost continually, several workmen were found to suffer from incipient atrophy. The district medical health officer therefore ordered the factory doctor to examine the sight of all workmen every month and report the results to him. Dr. Doifi, chief medical inspector in Budapest, bought bottled liquors in some fifty brandy shops and investigated the specimens as to methyl alcohol content. He found this poisonous substance even in a few of the most expensive liquors. The Hungarian law prohibits the use of methyl alcohol in the preparation of foods, or any substances, medicines or otherwise, intended for internal use. It is hoped that the attention which Doifi's investigation called to the subject will result in a new legislative prohibition of its use in the industries too, or at least the testing of the sight of workmen at regular monthly intervals in industries in which methyl alcohol is indispensable.

Phosphorus Necrosis

On April 1 of this year a new law came into force which prohibits the use of phosphorus in the manufacture of matches. Since that date, new facts came to light which were kept secret as long as phosphorus could be used in this industry. Dr. Kovacs, chief physician of one of the largest sick clubs in the country, who has paid particular attention to the study of phosphorus necrosis, said in a recent lecture that almost all workmen in the factories suffered in a greater or less degree from poisoning. This he attributes to the fact that particularly among workmen, it is a great exception to find persons who are not suffering from caries of the teeth, which is the most common means of entrance for phosphorus. As to the causation of phosphorus necrosis, he found in his studies that the fumes of the lower oxid of phosphorus given off from the moist phosphorus paste, in the course of manufacturing matches, exercise a local influence. It is also clear, he said, that the possession of carious teeth is a necessary factor in exciting the acute local necrosis. He found, too, that the bone of a match-maker and a healthy bone show a distinct difference in the relative proportions of phosphoric acid to lime, and this also is observed in cases of "phossy jaw." By the aid of the Roentgen ray it can be demonstrated that bone formed in young people working at phosphorus processes during the growing period is much denser in character than it otherwise would be.

The Contagiousness of Alopecia Areata

Dr. Coillag, dermatologist at the St. Stephan Hospital in Budapest, has devoted several years' study to the decision of the question, "Is alopecia areata contagious, or can it be?" In a recent lecture he resumed the results of his studies, and said that it is a decided fact that alopecia areata may become contagious. He has seen several epidemics in regiments and schools. The obvious conclusion is that the divergence of opinion in this matter arises from the observations of the various investigators, bearing on diseases similar in clinical appearance, but differing in their pathologic cause. Coillag holds that the weight of opinion at present appears to be in favor of a certain degree of contagiousness, but it is conceded to be unnecessary to insist on the same stringent precautions as in the case of ringworm. It is sufficient in a general way to keep the infected areas covered with a dressing of some sort, and to avoid the promiscuous use of brushes, towels, etc. It is important that this view should be made generally known.

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Marriages

DOUGLAS ARCHER LEHMAN, M.D., Harrisburg, Ill., to Miss Hazelle Lane of McLeansboro, Ill., June 18.

LOIS BOYD, M.D., Rock Hill, S. C., and Harry Goodwin Gaw at Stuart's Draft, Va., August 14.

LYMAN GOULD, M.D., Chicago, to Miss Marion Cooper of Kendallville, Ind., at Albion, Ind., August 1.

JOSEPH MICKLER, M.D., Hudson, Fla., to Miss Robie Beta Green of Chattanooga, Tenn., July 30.

CHESTER ARTHUR BLACK, M.D., to Miss Marguerite Thompson, both of Lima, Ohio, at Put-in-Bay, August 4.

Deaths

Thomas Croggan Smith, M.D. Georgetown University, Washington, D. C., 1864; a fellow of the American Medical Association; for more than fifty years a practitioner of Washington; surgeon of volunteers during the Civil War; once president and for thirty-five years corresponding secretary of the District of Columbia Medical Society; president of the Washington Obstetrical and Gynecological Society from 1897-99; consulting obstetrician to Freedman's Hospital; a trustee of Dickinson College, Carlisle, Pa., and president of the board of trustees of the Methodist Home for the Aged; died at his home in Washington, July 23, from acute gastritis, aged 70.

Oliver Brewster Taylor, M.D. Harvard Medical College, 1842; believed to be the oldest graduate of that institution; for many years a practitioner of Manchester and Manchester Green, Conn.; for more than fifty years a member of the school board of Manchester and for twenty years its secretary; died at the home of his son in Hartford, July 26, aged 93.

Joseph Kirby Corson, M.D. University of Pennsylvania, Philadelphia, 1863; major Medical Corps, U. S. Army, retired; one of the recipients of the Medal of Honor; a veteran of the Civil War; a member of the Medical Society of the State of Pennsylvania; since his retirement a resident of Plymouth Meeting, Pa.; died at his home in that place, July 24, aged 76.

John W. McPherson, M.D. Baltimore (Md.) Medical College, 1898; a member of the Medical Society of the State of North Carolina; a specialist in diseases of the eye, ear, nose and throat; of Haw River; aged 40; while despondent over family troubles, committed suicide July 27, at his father's home in Liberty, N. C., by cutting his throat with a razor.

William B. Cubbage, M.D. Starling Medical College, Columbus, Ohio, 1882; for more than forty years a practitioner of Saginaw County, Mich., and the first school commissioner of that county, serving for several terms; professor of materia medica in Saginaw Valley Medical College; died at his home in Freeland, July 31, from nephritis, aged 65.

Louis Peiser, M.D. University of Erlangen, Germany, 1886; a fellow of the American Medical Association and chief of the medical staff of the German Hospital, New York City; on whom the Emperor of Germany recently bestowed the Order of the Red Eagle; died suddenly in Carlsbad, Germany, August 5, from arteriosclerosis, aged 55.

Benjamin F. Jones, M.D. University of Louisville, Ky., 1887; a fellow of the American Medical Association and once president of the Eastland County (Tex.) Medical Society; for four years health officer of Cisco and local surgeon of the Missouri, Kansas and Texas Railway; died at his home, May 21, aged 56.

Charles Benjamin Heinzman, M.D. Rush Medical College, 1890; a member of the Illinois State Medical Society; of Metamora, Ill.; who was injured July 24 near Malcom, Iowa, by the overturning of his automobile; died at Mercy Hospital, Des Moines, July 31, aged 48.

Joseph Ingels, M.D. College of Physicians and Surgeons, Keokuk, Iowa, 1878; a member of the Kansas Medical Society; for thirty-nine years a practitioner of Pawnee County; died at his home in Larned, July 27, from cerebral hemorrhage, aged 64.

William H. McLenathan, M.D. New York Homeopathic Medical College, New York City, 1878; for many years a practitioner of the eastern district of Brooklyn; died at his summer home, Scragswood Camp, Willsboro, N. Y., July 30, aged 71.

James Henry Murray, M.D. Baltimore Medical College, 1912; of West River, Md.; intern at the Baltimore Municipal Tuberculosis Hospital and later junior intern in St. Luke's Hospital, Jacksonville, Fla.; died in that institution, July 23, from peritonitis, due to intestinal obstruction and following an attack of diphtheria, aged 25.

Frank M. Singer, M.D. Detroit College of Medicine, 1906; of Detroit; a member of the Michigan State Medical Society; aged 32; died in St. Mary's Hospital, Detroit, July 27, from injuries received that day in a grade-crossing accident in which his automobile was run into by a passenger train in the outskirts of Detroit.

Charles Henry Jernigan, M.D. Jefferson Medical College, Philadelphia, 1855; a member and once president of the Medical Association of the State of Alabama; a surgeon in the Confederate service throughout the Civil War; since 1886 a practitioner of Birmingham; died at his home in that city, July 28, aged 84.

George P. Hodson, M.D. Medical College of Evansville, Ind., 1876; a member of the Indiana State Medical Association and a member of the staff of Deaconess Hospital, Evansville; for twenty-five years associated in practice with Dr. Edwin Walker; died in the Gilbert Sanitarium, Evansville, July 30, aged 60.

William D. Straughn, M.D. Jefferson Medical College, 1890; a member of the Medical and Chirurgical Faculty of Maryland; a trustee of the Snow Hill High School; school examiner for three years and physician to the poor; died suddenly at his home in Snow Hill, July 30, from heart disease, aged 49.

Theodore Saulsbury, M.D. College of Physicians and Surgeons, Baltimore, 1875; for more than thirty years a practitioner of Burrsville, Md.; representative from Caroline County in the Maryland Legislature in 1908; died in the Delaware State Hospital, Farnhurst, July 24, aged 65.

Harlon Justin Morrill, M.D. College of Physicians and Surgeons, Chicago, 1902; of Chicago; was found dead in a rooming house in Cicero, August 4, aged 45. The coroner's jury returned a verdict of suicide from narcotic poison, while despondent on account of the death of his wife.

Alden Hebbard Wight, M.D. University of Michigan, Ann Arbor, 1870; formerly of New Hampton, Iowa, and for two terms recorder of deeds of Chickasaw County; a veteran of the Civil War; died at his home in Hermiston, Ore., about July 28, from cerebral hemorrhage, aged 70.

Anthony Seidler (license, Indiana, 1897); a resident of Dyer, Ind., for forty-six years; formerly coroner of Lake County and justice of the peace for more than thirty years; a surgeon of volunteers during the Civil War; died at his home, July 27, aged 87.

Edwin Forrest Farrow, M.D. College of Physicians and Surgeons, New York, 1866; died at his home in Peapack, N. J., June 21, from pneumonia; aged 51.

Anthony H. Worthington, M.D. Homeopathic Medical College of Pennsylvania, Philadelphia, 1860; died recently at his home in Trenton, N. J.

Edgar James Powers, M.D. Castleton (Vt.) Medical College, 1850; died at his home in Franklin, Vt., June 25, from senile debility, aged 85.

Zephrim Rouleau, M.D. Victoria College, Coburg, Ont., 1872; died at his home in Manteno, Ill., July 17, from angina pectoris, aged 66.

Edwin Augustine Kemp, M.D. University of Vermont, Burlington, 1862; died at his home in Lonsdale, R. I., June 12, aged 80.

John H. Cook, M.D. University of Alabama, Mobile, 1878; of Laurel, Miss.; died in an infirmary in Mobile, July 18, aged 60.

Charles G. Combs, M.D. New York University, New York City, 1888; died at his home in Rochester, N. Y., July 17, aged 53.

John Warren, M.D., New York City, advises us that the death notice which appeared in THE JOURNAL of August 2 is incorrect and that the individual who died was Dr. John Sidney Warren of New York City.

Edward Cooney, M.D., Appleton, Wis., asks that it be announced that he is not the Dr. Edward Cooney whose death was announced in THE JOURNAL of August 9 to have occurred in Brooklyn, N. Y.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

EVICTING MEDICAL FAKERS

How San Antonio Rid Itself of Fraudulent Medical Practitioners *

Many communities are afflicted with medical fakers because no one takes the initiative in suppressing frauds of this character. Members of the medical profession are sometimes loath to do so because of the belief that the public will misconstrue their motives. In most instances the civil authorities have been indifferent. And so these frauds flourish.

San Antonio, possibly because of its reputation as a health resort, has been a fertile field for medical frauds of all sorts, but through the action of the Bexar County Medical Society has been almost completely rid of such people. Texas has a medical practice law which differs little from the practice laws of many other states, but under the vigorous action of the legislative committee of the county society headed by Dr. Charles D. Dixon, chairman, assisted by their attorney, Mr. J. I. Kercheville, regularly employed by the committee, practically all of these people have been driven out of the community. Only three firms of advertising specialists remain, and against the men composing these firms charges have been filed for the revocation of their licenses.

The procedure adopted was, first, to procure from the records of the district clerk's office the names of all registered physicians of the county. These names were printed in a pamphlet and one mailed to each member of the county society with a letter asking him to carry the list with him and to report the names of all unregistered practitioners to the chairman of the committee. Each case of these illegal practitioners, including those who advertised in the extravagant manner usual to such individuals, was taken up and investigated. A patient would be sent to them and in this way evidence secured against them. An affidavit was then filed in the criminal court, the persons arrested and the case set for trial, which seems to be a method of procedure provided in Texas without having a preliminary hearing and obtaining the usual grand-jury indictment. The cases were then tried and in all but two or three instances convictions were obtained. The prosecutions for violation of the postal laws were, of course, brought in the federal court.

This work was approved by the courts and by the citizens generally. It is, of course, the interest of the people which is best served by such action, but they do not always so understand it and it is gratifying in this instance to note that the work of the physicians of Bexar County had the hearty approval of the public.

The list of prosecutions, a statement of each of which is given herewith, shows how sorely San Antonio and Bexar County were afflicted with medical frauds of great variety. The list, with the other information contained in this article, was furnished by Dr. Charles D. Dixon from the court records and from his own files as chairman of the legislative committee of the Bexar County Medical Society.

PROSECUTIONS UNDER THE TEXAS MEDICAL PRACTICE LAW

Philicarpa Reuda came to San Antonio from Mexico and began practicing medicine without registering his license. He was arrested, June 5, 1912. At the trial, July 15, 1912, he pleaded guilty and was given a fine of $50 and one hour in jail.

J. Martin, a Mexican, was arrested, May 15, 1912, for selling medicine on the street and recommending it to cure any kind of disease. On Sept. 11, 1912, when his case was called, it was found that he had left the country, forfeiting his bond.

"Mrs. Dr." A. B. McCanna, who called herself an "Electro-Therapeutist" and claimed to have an electrical battery made in France after her own invention, which would cure all diseases, even tuberculosis in the last stages, was arrested, June 13, 1912. When her case was called, Sept. 13, 1912, it was found that she had left, and her bondsmen were compelled to pay the bond.

George H. Carr advertised "Carr's Sun Cure," which was guaranteed to cure when all other remedies had failed. He was arrested, July 17, 1912, and convicted Sept. 21, 1912, getting a fine of $50 and thirty days in jail. Carr testified on the witness stand that if one would take his medicine according to directions he would never die.

George Washington White conducted a sanatorium, treating tuberculosis with an inhaler of his own invention, using herbs which he claimed came from Madagascar. After some correspondence with White, a woman detective with a young man as witness went to White, who told her she had five cavities in her lungs; he guaranteed to cure her for $75. A partial payment was made and on Oct. 14, 1912, he was arrested and tried and convicted, Dec. 21, 1912. He was fined $500 and given ninety days in jail. He appealed the case to the Court of Criminal Appeals, but in April, 1913, the verdict of the lower court was affirmed.

W. N. Norwood conducted a hospital for tuberculosis, treating his patients by having them inhale smoke from ordinary oak wood. He had a pit arranged in his yard in which he burned the wood, and the smoke was conducted through a flue to a box in his office from which the patient breathed the smoke. He guaranteed to cure any case of tuberculosis. He was arrested, Oct. 4, 1912, tried before a jury and convicted, Feb. 18, 1913. He was required to pay a fine of $200 and to spend thirty days in the county jail. An appeal is still pending.

"Dr." F. Pierce, an old negro, called himself an "Indian Doctor," making and prescribing his own medicine. He was arrested, Sept. 30, 1912, for practicing medicine without a license and pleaded guilty, Feb. 19, 1913. He was fined $50 and given one hour in jail.

W. L. Dorn, a negro "magnetic healer," was arrested, Feb. 4, 1913, and pleaded guilty, April 24, 1913. He had no license. He was fined $50 and given one hour in jail.

Dr. I. Mendez, a "magnetic healer," was arrested, Feb. 4, 1913, for practicing medicine without a license. He pleaded guilty, May 7, 1913, and was fined $50 and given one hour in jail.

Dr. Thomas T. Woody practiced medicine under an assumed name, his license being registered under the name of C. D. Anderson. He was arrested, April 21, 1913, and convicted, May 7, 1913. He was given a fine of $50 and one hour in jail.

"Prof." A. F. Haslem advertised a preparation under the name of "Mrs. Black's Compound" for all irregularities of women. Letters directed to him requesting medicine and directions for producing a miscarriage were promptly answered, supposedly giving the desired information. A woman was also sent to see him. He examined her by looking into her eyes through a magnifying glass, telling her that she was pregnant. He prescribed remedies to produce abortion. He was arrested, Nov. 15, 1912, for violating the postal laws, convicted, May 20, 1913, and sentenced to eighteen months in the United States prison at Fort Leavenworth, Kan.

"Mrs. Dr." Susanna Norton used the United States mail for sending medicine to produce abortion. She was arrested, Nov. 15, 1912, and convicted, Jan. 8, 1913. She was fined $250 and her license to practice midwifery was revoked.

Dr. J. Harvey Moore defined himself as an "eye specialist" and was known as the "Oscillator Man." On account of an operation on a patient's eye, a suit for malpractice and personal damages was filed against him, Sept. 25, 1912. The trial, Dec. 18, 1912, resulted in damages of $3,202. In order to avoid payment of the judgment Dr. Moore disappeared without leaving his address.

Dr. A. G. Dellenbaugh was arrested, Sept. 30, 1912, for practicing medicine without a license. He pleaded guilty, May 7, 1913, and was fined $50 and given one hour in jail.

Fred Wegley was arrested, Nov. 2, 1912, for selling a fake preparation known as "Lopez' Remedy," which he recommended for the cure of various diseases. He pleaded guilty, May 7, 1913, and was fined $50 and given one hour in jail.

"Dr." C. M. Brondo, a Mexican woman, had secured from her druggist a list of prescriptions supposed to be for various diseases. When a patient called on her she would have the patient make his own diagnosis and she would give the prescription for the trouble named. She was arrested, Oct.

* The above article also appears in a pamphlet entitled "Quacks, Itinerant and Otherwise." Price 4 cents.

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15, 1912, for practicing medicine without a license, and convicted, Dec. 19, 1912, being fined $50 and given one hour in jail.

J. N. Stone, a "chiropractic" masseur, was arrested, March 12, 1913, for practicing medicine without a license. His case has not yet been tried.

Drs. J. H. Terrill and H. E. Truax ran an institute for many years in San Antonio called the Terrill Medical Institute, its patronage being secured, it is said, by disgraceful advertising. A suit for malpractice and personal damages on two charges was filed, Jan. 8, 1913, and May 1, 1913. A judgment of $500 was rendered against them. Terrill then retired from the institute, which is still being run by H. E. Truax.

Drs. T. M. Stotts and S. V. Young advertised as the "German-American Doctors." A bottle containing salt and water colored with tincture of iron was taken by a supposed patient to the "German-American Doctors" with the statement that he was having trouble with his kidneys. After an alleged examination of the specimen, they told him he was suffering with Bright's disease and that he was full of urates and uric acid. They guaranteed a cure for $75. Suit for revocation of license was brought, April 30, 1913, and is still pending.

Dr. George H. LeRoux conducted a "college," advertising to graduate pupils in osteopathy in ten days, giving them a diploma guaranteed to give them the right to practice medicine anywhere in Texas. Action was begun in the federal court, July 26, 1912, for using the United States mails to defraud, when the so-called institution was closed and Dr. LeRoux departed suddenly for California, Aug. 1, 1912.

"Mrs. Dr." E. B. Kimble was arrested for practicing medicine without a license, May 7, 1913. The case is still to be tried.

Mrs. M. L. Gracey, an agent for the "Viavi" preparations, was arrested for practicing without a license, Nov. 2, 1912. The evidence presented in the trial, Dec. 31, 1912, was said to be absolutely convincing, but the jury rendered a verdict of not guilty, perhaps through sympathy for a "pretty woman."

Mrs. Amelia Jost, a "magnetic healer" and a masseuse, was arrested, Dec. 10, 1912, for treating cancer. In this case also, through sympathy, a verdict of not guilty was rendered by a jury, Jan. 28, 1913. The latter two cases are the only instances on which prosecution failed.

Dr. H. Erl Coger of the "Famous Erle Institutes of the World," a "beauty specialist," attempted to practice medicine without a license. He was arrested, Nov. 3, 1912, but left the country, forfeiting his bond, Nov. 20, 1912. He left a message that he was "disgusted with the medical profession of San Antonio."

Dr. A. Pratt, of the "Pratt Institutes of New York and Chicago," another beauty specialist, was frightened away by the action against H. Erl Coger.

The case of F. H. Seeley, the "truss expert," "who fitted the Czar of Russia," and who was arrested, May 7, 1913, is still to be tried.

A. G. Delleabaugh and G. W. White, mentioned before, were arrested the second time in June, 1913, but have not yet been tried.

Among the other successful prosecutions were the cases of two traveling opticians who were arrested at Halletsville for treating diseases of the eye. Both were convicted and fined $50 each and given one hour in jail. Fourteen "fortune-tellers," who did "magnetic healing" on the side, were convicted of vagrancy and made to pay a fine. A number of other fakers were caused to cease their business by a warning that they would be prosecuted if they continued their misleading advertisements. In addition about fifty individuals selling different kinds of "cure-all" preparations were induced to move out of San Antonio.

Our old friends, the "United Doctors," visited San Antonio, but evidently did not like the "pernicious activity" of the committee of the county medical society and did not attempt to do any business. They were arrested at Lockhart, however, for practicing without a license, and were fined $50 and lodged in jail over night. Their promise to leave the state was not kept.

At Amarillo, in Potter County, two of the United Doctors were arrested for having no license, fined $50 and compelled to spend one night in jail. For some infraction of the self-imposed rules of the prisoners in the jail they were tried by the tribunal of the prisoners and fined one dollar. On their refusal to pay this fine it is said that they were subjected to the humiliation of the application of the strap where it would do most good. They then paid the fine.

The action of the legislative committee of the Bexar County Medical Society who are ridding the community of these frauds shows what can be done in practically every state, under present medical practice laws, if the matter is taken up in a vigorous manner. Physicians of the state of Texas are interested in the work of the Bexar County Medical Society, and similar action will doubtless be taken in other communities. When rightly understood, similar action by the medical societies in every state will be approved by the people.

MORLENE

A Fraudulent Goiter and Obesity Nostrum

Morlene is a preparation sold under the claim that when used externally it "will reduce goiter, tumors, thick neck, double chin, enlarged joints, inflammations, bust and waist line." It is put on the market by the Interstate Drug Co., Cleveland, O. Letters from the Interstate Drug Company are signed F. F. Finch. Two or three years ago, Finch was engineering a scheme by which physicians who prescribed certain products said to be made by the Wade Chemical Company, Chicago, were to receive half the profits on the goods sold. This disgraceful proposition was presented to certain Philadelphia physicians by one F. W. Drake, who was apparently the eastern representative of Finch. The Chicago directories list no such concern as the Wade Chemical Company, but the Federal Detail and Brokerage Company, 160 North Fifth Avenue, Chicago, declared when asked, that letters intended for the Wade Chemical Company should be addressed to them. And it is the Federal Detail and Brokerage Company to whom F. F. Finch referred prospective Chicago purchasers of Morlene.

Here are some of the claims made for Morlene:

"A tissue absorbent for reducing excess flesh or unnatural growths."

"Will produce absorption of all growths that can be reached by external application."

"Will absorb tumors and abnormal growths."

"Successfully used by many ladies to reduce the waist line and bust."

Specimens of Morlene were purchased on the open market and examined in the Association's laboratory. The chemists reported as follows:

The specimen of Morlene examined is a pale grayish-yellow translucent, jelly-like substance having an odor of alcohol. Except for a statement on the label that the preparation contains 90 per cent. of alcohol, no information is given concerning its composition.

Qualitative tests demonstrated the presence of alcohol, an iodid, combined fatty acids, sodium and sugar. Neither dextrin, thyroid extract, gum nor starch were found. Quantitative examination indicated that the composition of the specimen of Morlene examined is essentially as follows:

Alcohol (by weight)	53.32 per cent.
Soap	3.61 per cent.
Sodium iodid	12.01 per cent.
Sucrose (cane sugar)	12.87 per cent.
Water and undetermined (by difference)	18.19 per cent.

From the chemists' report it is evident that Morlene is essentially a gelatinized alcoholic solution of soap containing sodium iodid and sugar. While the iodids in organic combination have some reputation as obesity remedies, if taken internally, there is no evidence to show that inorganic iodids—such as the sodium iodid in Morlene—when applied externally to the unbroken skin would have the slightest influence on metabolism. Physiologic tests were made to determine whether or not the sodium iodid in Morlene was absorbed when the preparation was rubbed on the skin. Examination of the saliva and urine following such applications showed that none of the sodium iodid was absorbed; this, too, although the Morlene was rubbed on the skin and allowed to remain for twelve hours. The sugar and soap in Morlene are, of course, equally worthless for inducing "more lean" in the obese. In brief, Morlene is a worthless and fraudulent product.

Correspondence

Indigent Consumptives in the Southwest—A Warning

To the Editor:—I wish that publicity be given to the fact that this community, which is famed as a health-resort in the dry zone of the Southwest, will not give financial assistance—free hospitals or sanatorium service or transportation—to the hundreds of indigent tuberculous persons who apply for aid each year. So many incurable patients arrive here without means of support, and yet with hope of climatic cure and remunerative employment, that I desire these full explanations be made:

1. Such rainbow-chasing is a cruel hoax to perpetrate on a dying consumptive.

2. Comfort and treatment are expensive and continuous.

3. It is the rare exception, and growing rarer, that a tuberculous person can obtain employment, no matter how great his ability.

George D. Troutman, M.D., Sec'y Board of Health, Pima County, Tucson, Ariz.

Glimpse of a Great Surgeon

To the Editor:—In a recent number of The Journal (Sept. 7, 1912, p. 814), mention was made of the semicentennial celebration of the first ovariotomy performed in France by Dr. Koeberle of Strasburg, who is now living in retirement. The operation had been performed in England, Germany and America shortly before Dr. Koeberle undertook his. At that time the performance of such a daring thing as an abdominal operation was looked on as almost criminal.

About six years ago I happened to be traveling between Heidelberg and Paris. When the train stopped at Strasburg, three people entered my compartment; a middle-aged, heavy-set woman, accompanied by a gentleman who shortly after repaired to the smoker; and a very old gentleman wearing a long black coat and a high hat, from under which straggled a few locks of white hair. Looking over the top of my book, which was, nevertheless, quite interesting, I was fascinated by the appearance of this old gentleman who wore the little red ribbon of the Legion of Honor in his buttonhole. All attempts to place him, or "size him up," failed. The only thing to which I could compare him was the castle in Heidelberg—in other words, he seemed to be a grand ruin, the remains of what must once have been an imposing physique, with doubtless a marvelous personality.

A little later the lady caught the old man's eye and greeted him, asking about his health, his wife, and his castle. In his replies the old gentleman conveyed the information that he was carrying on archeologic researches, that he had not found very much of importance in his diggings, and that at his age he preferred to travel by rail, whereas his wife journeyed to their castle in Lutzenfeld by automobile.

The old gentleman answered all questions with an effort and was certainly far from interested. Before long his head dropped forward, and he resumed his meditations.

Perhaps twenty minutes later the lady again attracted his attention by remarking that the professor probably did not remember her, to which he replied, "I must confess that you are right!"

"Well," said she, "do you remember the first big surgical operation you ever performed? My mother and your aunt brought you the patient and induced you to operate."

"To be sure!" said the professor, becoming animated, his eyes glowing. "It was the fiancée of a locomotive engineer, and the next year she had twins!"

A few personal remarks were interchanged, and the train approaching his destination, he left the train.

Shortly afterward I asked the lady the name of the gentleman, to which she replied that although I could not be acquainted with medical subjects, she would tell me the story.

It seemed that this lady's mother and the doctor's aunt were very close friends, and had always predicted a big future for young Koeberle, whom as a boy they had watched cutting open and sewing up birds. After he had been practicing for a while, a young girl who had been in their employ at various times, and whom they knew to be poor but good, began to attract a great deal of attention and to set tongues wagging in the village by the increased size of her abdomen. Rather than endure it any longer, the girl had threatened suicide, and certainly would have carried out her threat had these two good souls not persuaded young Koeberle to perform a radical operation for the cure of what proved to be an ovarian tumor, which the doctor did in the presence of a great number of physicians. This encounter in a railway train with one of the most famous European surgeons was to me so interesting that I felt that its reading might be pleasing to others.

René Bine, M.D., San Francisco.

"The First Fifteen Medical Colleges in the United States"

To the Editor:—In The Journal (April 26, 1913, p. 1318) is given a list of the "first fifteen medical colleges in the United States." In this list the Castleton Medical College is not mentioned. I quote from the *Vermonter* for May, 1903:

The first medical school established by act of the legislature in Vermont was chartered Oct. 29, 1818. This act gave to Drs. Theodore Woodward and Selah Gridley and their associates the charter of "The Castleton Medical Academy." A subsequent act in 1819 gave them the power to "confer those honors and degrees which are usually conferred by medical institutions." The first course of lectures at Castleton began Nov. 15, 1818. In 1821 the name of this institution was changed to the "Vermont Academy of Medicine." The fatal illness of Professor Woodward in 1838 arrested the work of the school temporarily, but in 1839 a new faculty was elected and in 1841 the name was again changed to the "Castleton Medical College," and from this time for twenty years the school prospered. During the period from 1820 to 1827 a "conventional connexion" existed between this institution and Middlebury College, by which the degrees were conferred either at Castleton or Middlebury on such students as were found worthy. The Castleton Medical College for many years occupied a prominent position in the medical world. Its graduates numbered 1,542 and its faculty at various times was 41.

Charles W. Allen, M.D., Hoboken, Pa.

[Comment.—Our correspondent's point is well taken. It should have been stated that our previous list gave the fifteen colleges first organized, which continue to exist either as originally organized or under the names of other schools with which they merged. The following seven medical schools were organized during the same period, but later became extinct. The rank of each is shown by the figures in parentheses:

1. 1911, (7) Brown University Medical Department, Providence, R. I. Extinct 1827.

2. 1813, (9) College of Physicians and Surgeons of the Western District of New York, Fairfield. Extinct 1840.

3. 1818, (11) Castleton Medical College, Castleton, Vt. Extinct 1861.

4. 1823, (16) Berkshire Medical College, Pittsfield, Mass. Extinct 1867.

5. 1826, (19) Medical College of the Valley of Virginia, Winchester. Extinct 1861.

6. 1826, (20) Winchester Medical College, Winchester, Va. Suspended 1829. Revived 1850. Burned and extinct in 1861.

7. 1827, (22) Washington University School of Medicine, Baltimore. Suspended 1851. Reorganized 1867. Extinct in 1877.

A life chart showing all medical colleges which have been organized in the United States is to be published in the next Educational Number of The Journal, Aug. 23, 1913.—Ed.]

The Physician and Public Health.—The thoughtful physician regards himself as much more than a physician to the individual case. In the larger work of eradicating communicable disease from society he is the diagnostician and health authorities must have his diagnosis before they can apply the remedial measures necessary.—*Bull. Ohio State Board of Health.*

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Queries and Minor Notes

ANONYMOUS COMMUNICATIONS will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

BENEFITS DERIVED FROM CHANGE OF CLIMATE FOR TUBERCULOUS PATIENTS

To the Editor:—I have a tuberculous patient whom I have advised to go to the Pacific coast. This is a case following pneumonia and pleurisy and, although he spits blood, he has had no hemorrhage. He is in moderate circumstances and can well afford to be idle for several months. Can you advise me as to the best place for him, sanatorium or otherwise, and also give me the name of a good, reliable doctor to place him under?

J. FARRAGE, M.D., Deering, N. Dak.

ANSWER.—Our correspondent fails to state the part of the coast to which he has advised his patient to go, consequently we refer him to the sanatoriums listed in THE JOURNAL, and for information concerning physicians to the American Medical Directory. It is hardly necessary to say that the physician himself must assume the responsibility for deciding whether the patient shall make a change of climate and where he shall go. Each case must be decided on its individual merits. It is generally admitted that patients who are in a condition to take full advantage of the opportunities for out-door life afforded in the southwestern climate are benefited by such a change, but that if they must remain indoors, locality makes little difference. Two matters are of special importance in deciding the question: 1. The physical condition of the patient. Advanced tuberculous disease and conditions which are sufficiently active to cause fever contra-indicate a removal to another climate. 2. The financial status. Tuberculosis which can be benefited by removal to another climate is a chronic disease; recovery is a matter of years, and a premature return to an unfavorable climate will undo the benefits already obtained. Consequently, the patient who contemplates removal to another climate should be prepared to live in comfort for one or two years. The treatment is necessarily an expensive one, and the numerous cases in which patients have been sent to a strange community to become public charges warn us not to recommend such a course except when the financial situation makes it possible without hardship. The psychic influence of such a change should be carefully considered; to send such a patient away from home among strangers cannot fail to have a depressing and unfavorable influence on his disease. This, of course, will be more marked in some cases than in others.

SARCOMA IN CHILDREN

To the Editor:—Please give references to literature on sarcoma in children. W. G. WARD, M.D., Lynn, Mass.

ANSWER.—The following may be referred to:

Bondy, J.: Angiosarcoma of the Liver in an Infant, THE JOURNAL, A. M. A., March 25, 1911, p. 873.

Alexander, H.: Sarcoma in Pelvis in Children, *Arch. f. Kinderh.*, 1912, lviii, Nos. 1-3; abstr., THE JOURNAL, Aug. 3, 1912, p. 406.

Miningham, W. D.: Sarcoma of the Uterus in a Child; Operation; Recovery, *Jour. Med. Soc. New Jersey*, April, 1910; abstr., THE JOURNAL, April 23, 1910, p. 1406.

Lesage, A. and Girault: Sarcoma of Ovary in Infant, *Arch. de méd. des enfants*, March, 1913.

McCarley, T. H.: Sarcoma of the Kidney in Infants, *Jour. Oklahoma State Med., Assn.*, November, 1912.

Cline, L. C.: A Case of Sarcoma of the Tonsil in a Young Child, *Laryngoscope*, March, 1911.

Rocher, H. L.: Sarcoma of Upper Jaw in Infant Under Two, *Rev. mens. de gynéc., d'obst. et de pédiat.*, March, 1912.

Carson, N. B.: Excision of the Clavicle for Small Round-Celled Sarcoma in Child of Nine Years, *Interstate Med. Jour.*, August, 1911.

Wellington, J. R.: Sarcoma of Kidney in Child of 16 Months, *Washington Med. Ann.*, March, 1910.

ACTION OF SALIVA ON BLUE LITMUS

To the Editor:—Kindly explain why the saliva from some tongues turns blue litmus red. A patient told me that her dentist said she was "full of acid" and that "acid was hurting her teeth." Saliva from her tongue did turn litmus red, while my own did not.

C. B. A., Toledo, Ohio.

ANSWER.—The saliva may readily become acid from fermentation occurring in the mouth, especially in interstices between the teeth. This fermentation is usually productive of lactic acid. The influence of general conditions on the reaction of the saliva has not been very thoroughly investigated although there is evidence that it sometimes becomes acid from the condition of the blood without local fermentation.

Medical Economics

THIS DEPARTMENT EMBODIES THE SUBJECTS OF POST-GRADUATE WORK, CONTRACT PRACTICE, LEGISLATION, MEDICAL DEFENSE, AND OTHER MEDICOLEGAL AND ECONOMIC QUESTIONS OF INTEREST TO PHYSICIANS

ALASKA'S NEW MEDICAL PRACTICE ACT

The practice act recently enacted by the Alaska Territorial Legislature does not differ in any essential particular from those in force in most of our states. As the latest enactment on this subject, this law will be of interest. An abstract follows:

Board.—The Territorial Medical Examining Board consists of eight members, two from each judicial district, appointed by the governor, for a term of two years and no member is to serve for more than two terms in succession.

Board Members.—J. L. Myers, M.D., Ketchikan; J. H. Mustard, M.D., Nome; J. M. Sloan, M.D., Nome; D. H. Sleem, M.D., Valdez; J. H. Romig, M.D., Seward; W. G. Cassels, M.D., Fairbanks; I. H. Moore, M.D., Ruby; H. C. DeVighne, M.D., Juneau, secretary.

Examinations.—Examinations are held beginning on the first Tuesday of January and July of each year at Juneau, or such other place as the board may designate.

Fees.—Examination or reciprocal registration fee, $25.

Application for License.—Applicant must show evidence of being 21 years of age, of good moral character, and must have graduated from a duly authorized medical college. He must submit to a written but practical examination in anatomy, physiology, chemistry, histology, materia medica, therapeutics, preventive medicine, practice of medicine, surgery, obstetrics, diseases of the eye and ear, medical jurisprudence and such other subjects as the board deems advisable.

Temporary Permits may be issued, valid until the next meeting of the board. The board is empowered to refuse or revoke a license for cause.

College Standard.—Applicant must have graduated from a "duly authorized medical college" defined in relation to temporary permits as a college having standards equal to those of the Association of American Medical Colleges.

Reciprocity.—The board in its discretion is empowered to license without examination applicants holding licenses from other states which have reciprocal relations with Alaska, where the applicant fully complies with the requirements of the territory.

Exemptions.—The act does not apply to emergency services or to commissioned officers of the United States service while in the performance of their official duties, or to physicians or surgeons from the United States called into consultation, or to physicians actually practicing in Alaska prior to the passage of this act. There is to be no discrimination against any particular school of medicine, surgery or osteopathy.

Definition.—Any person shall be deemed as practicing within the meaning of this act who shall have and maintain an office or place of business with his or her name and the words "physician and surgeon," "Doctor," "M.D" or "M.B." in public view, or shall assume or advertise the title of doctor or any title which shall show or shall tend to show that the person assuming or advertising the same is a lawful practitioner of any of the branches of medicine or surgery in such a manner as to convey the impression that he or she is a practitioner of medicine or surgery under the laws of this territory, or any person who shall practice medicine or surgery under a false or assumed name, or for a fee prescribe, direct or recommend for the use of any person any drug or medicine for the treatment, care or relief of any wound, fracture or bodily injury, infirmity or disease.

Note.—Until the present practice act was secured the laws regulating medical practice in Alaska were contained in the criminal code, approved March 3, 1899, and the civil code, approved June 6, 1900, and amendments approved Feb. 6, 1909, (Sections 10 to 18 of an act of Congress entitled: "An act relating to affairs in the territories," approved Feb. 6, 1909, 35 Statutes at Large, 600.) Present law approved April 29, 1913.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

MASSACHUSETTS: State House, Boston, September 9-11. Sec., Dr. Walter P. Bowers, Room 159, State House.

MISSOURI: Coates House, Kansas City, September 2-4. Sec., Dr. J. A. B. Adcock, State House, Jefferson City.

NEW YORK: September 23-26. Chief of Examinations Division, Mr. Harlan H. Horner, Department of Education, Albany.

Arkansas May Report

Dr. F. T. Murphy, secretary of the State Medical Board of the Arkansas Medical Society, reports the written examination held at Little Rock, May 13-14, 1913. The number of subjects examined in was 12; total number of questions asked, 10; percentage required to pass, 75. The total number of candidates examined was 78, of whom 56 passed and 22 failed. Eleven candidates were licensed through reciprocity. The following colleges were represented:

PASSED

College	Year Grad.	Per Cent.
University of Arkansas (1913) 75.8, 76.3, 76.7, 76.7, 76.9, 76.9, 77.6, 78.4, 78.9, 78.9, 80.1, 80.1, 80.2, 80.9, 82.6, 84.2, 84.4, 86.6, 89.2, 90.3.		
Chicago College of Medicine and Surgery	(1913)	88.3
University of Illinois	(1905)	89.9
Rush Medical College	(1884) 81.1; (1886)	81.7
Hospital College of Medicine, Louisville	(1904) 81.9; (1893)	83.2
St. Louis University	(1912)	86.6
Jefferson Medical College	(1910) 92.8; (1912)	87.1
Memphis Hospital Medical College (1913) 78.2, 78.7, 80.5, 81.3, 81.5, 81.9, 83.6, 83.7, 85.2, 86.1, 87.9, 88.3, 88.5, 88.6.		
University of Tennessee, Nashville (1911) 83.8; (1912) 77; (1913) 80.5, 83.8, 87.2, 92.9.		
Meharry Medical College (1913) 77.2, 75.8, 80.9, 84.2.		
University of Nashville	(1903)	79.3
College of Physicians and Surgeons, Memphis	(1907)	71.2*
Chattanooga Medical College	(1897)	72.4*

FAILED

College	Year Grad.	Per Cent.
University of Arkansas (1911) 71.1; (1912) 59.6, 72.5; (1913) 58.6, 64.3, 72.4, 72.6, 73.3, 74.2.		
College of Physicians and Surgeons, Little Rock	(1910)	39.7;
Louisville Hospital and Medical College	(1908)	55.6
University of Tennessee	(1913)	74.5
Meharry Medical College (1912) 50.9, 70.8; (1913) 52.6, 53.3, 62.5, 62.5.		
Memphis Hospital Medical College (1912) 67.2; (1913) 63.1, 74.2.		

LICENSED THROUGH RECIPROCITY

College	Year Grad.	Reciprocity with
George Washington University	(1904)	Louisiana
Atlanta School of Medicine	(1911)	Georgia
Chicago College of Medicine and Surgery	(1912)	Illinois
Rush Medical College, (1895) Wisconsin; (1897)		Illinois
Kentucky University	(1906)	Kentucky
Jefferson Medical College	(1907)	Penn.
Medico-Chirurgical College of Philadelphia	(1908)	Penn.
University of Nashville, (1903) Mississippi	(1909)	Mississippi
Memphis Hospital Medical College	(1901)	Mississippi

* Credit allowed for five or more years of practice.

Georgia May Report

Dr. C. T. Nolan, secretary of the regular Board of Medical Examiners of the State of Georgia, reports the written examinations held at Atlanta, May 8-10, and at Augusta, May 15-17, 1913. The number of subjects examined in was 10; total number of questions asked, 100; percentage required to pass, 80. At the examination held at Atlanta, the total number of candidates examined was 146, of whom 129 passed and 17 failed. The following colleges were represented:

PASSED

College	Year Grad.	Per Cent.
Birmingham Medical College	(1911)	84.5
George Washington University	(1911)	87
Atlanta College of Physicians and Surgeons (1913) 80, 80, 80, 80, 80, 80.5, 80.5, 81, 81.5, 81.5, 82, 82, 82.5, 82.5, 83, 83, 83, 83.5, 84, 84, 84, 84, 85, 85, 85.5, 85.5, 85.5, 86, 86, 86, 86, 86, 87, 87, 87, 87, 87.5 87.5, 88, 88, 88, 88.5, 88.5, 88.5, 88.5, 88.5, 88.5, 88.5, 89, 89, 89, 89, 89, 89, 90, 90, 90, 90, 90, 90.5 90.5, 91, 91, 91.5, 91.5, 91.5, 91.5, 91.5, 92, 92.5, 93, 93, 93, 93.5, 93.5, 93.5, 94, 94.5, 97.		
Atlanta School of Medicine (1913) 80, 80, 81, 81, 81.5, 81.5, 82, 82.5, 83.5, 84, 84, 84, 85, 85, 85.5, 85.5, 85.5, 85.5, 86, 86, 86, 86, 86.5, 88, 88, 88.5, 89, 89, 90.5, 90.5, 91.5.		
Southern College of Medicine and Surgery (1913) 87.5, 89.5.		
University of Louisville	(1912)	80
Medical School of Maine	(1901)	87
Johns Hopkins University	(1910) 87; (1911)	92.5
University of Maryland	(1911)	84.5
Columbia University, College of Physicians and Surgeons	(1912)	83
North Carolina Medical College	(1913)	88.5
Meharry Medical College (1913) 80.5, 81.5, 87.5, 93.5.		
University of the South	(1904)	92

FAILED

College	Year Grad.	Per Cent.
Southern College of Medicine and Surgery Atlanta (1913) 67, 68.5, 69.5, 71, 71.5, 72, 74.5, 74.5, 76.		
Atlanta School of Medicine	(1913)	73
University of Louisville	(1912)	68
Meharry Medical College (1908) 65.5; (1912) 68.5, 74, 77.5; (1913) 75.		
Knoxville Medical College	(1908)	61.5

At the examination held at Augusta, the total number of candidates examined was 29, of whom 27 passed and 2 withdrew. The following colleges were represented:

PASSED

College	Year Grad.	Per Cent.
Atlanta College of Physicians and Surgeons	(1912)	83
University of Georgia (1912) 87.5; (1913) 80, 80, 83.5, 84, 84.5, 85, 85, 85.5, 86, 86, 86.5, 86.5, 88.2, 88.5, 88.5, 88.5, 89.5, 91, 91, 91.5, 91.5, 91.5.		
University of Pennsylvania	(1911)	89
South Carolina Medical College	(1911)	80

Nebraska May Report

Dr. C. P. Fall, secretary of the Nebraska State Board of Health, reports the written, oral and practical examination held at Lincoln, May 28-29, 1913. The number of subjects examined in was 14; total number of questions asked, 100; percentage required to pass, 75. The total number of candidates examined was 62, of whom 60 passed and 2 failed. Two candidates were licensed through reciprocity. The following colleges were represented:

PASSED

College	Year Grad.	Per Cent.
Rush Medical College, Chicago	(1898) 84.5; (1913)	85.2, 86.7
Hahnemann Medical College, Chicago	(1913)	81.2
Chicago College of Medicine and Surgery (1913) 76.8, 78.2, 81.5, 82.8		
Bennett Medical College	(1913)	80.7
Kansas Medical College	(1913)	81.3, 84.5
Ensworth Medical College	(1913)	81, 84.5
Kansas City Hahnemann Medical College	(1913)	82.7
Creighton Medical College (1911) 76.8; (1912) 79.6, 80.7; (1913) 76.2, 77.1, 78.5, 78.8, 79.6, 80.1, 80.5, 80.5, 80.6, 81, 81.7, 81.7, 81.8, 82, 82, 82.3, 83.3, 83.5, 83.6, 83.7, 83.8, 85, 86.1, 86.5		
Cotner Medical College (1913) 76.2, 79.2, 79.8, 80.8, 81.5, 82, 82.3		
University of Nebraska (1913) 79.5, 79.7, 83.1, 83.6, 84.7, 85, 85.1, 85.3, 86		
New York University Medical College	(1906)	80.8
University of Pennsylvania	(1913)	86.7
Jefferson Medical College	(1912)	84.7

FAILED

College	Year Grad.	Per Cent.
Creighton Medical College	(1912) 74.2; (1912)	74.6

LICENSED THROUGH RECIPROCITY

College	Year Grad.	Reciprocity with
Bennett Medical College	(1906)	Illinois
St. Louis College of Physicians and Surgeons	(1909)	Arkansas

Utah July Report

Dr. G. F. Harding, secretary of the Utah Board of Medical Examiners, reports the written examination, held at Salt Lake City, July 6-7, 1913. The number of subjects examined in was 20; total number of questions asked, 100; percentage required to pass, 75. The total number of candidates examined was 8, of whom 7 passed and 1 failed. Four candidates were licensed through reciprocity. The following colleges were represented:

PASSED

College	Year Grad.	Per Cent.
University of Colorado	(1913)	86.9
Northwestern University Medical School	(1912) 81.1; (1913)	82.9, 89.9
College of Physicians and Surgeons, Baltimore	(1913)	79.2, 84.4, 84.7

FAILED

College	Year Grad.	Per Cent.
Chicago College of Medicine and Surgery	(1913)*	

LICENSED THROUGH RECIPROCITY

College	Year Grad.	Reciprocity with
Harvey Medical College	(1904)	Illinois
University of Iowa, College of Medicine	(1906)	Iowa
University of Nebraska	(1898)	Wyoming
New York Medical College and Hospital for Women	(1900)	New York

* No grade given.

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Medicolegal

Sufficiency of Complaint of Practicing Without Registration

(White vs. State (Tex.), 157 S. W. R. 152)

The Court of Criminal Appeals of Texas affirms a conviction of the appellant (defendant) White of violating the physicians' registration law. The complaint charged that he did publicly profess to be a physician, and did "unlawfully treat a disease or disorder," to wit, did treat a named person for tuberculosis and also for constipation, without having first registered in the district clerk's office, etc. In his motion in arrest of judgment he sought to make the point that the use of the word "or" between the words "disease" and "disorder" rendered the complaint defective because in the disjunctive. But the court does not think that it could be said that the use of the word "or" left the complaint in a confused state. When it said a disease or disorder, to wit, tuberculosis, there could be no uncertainty. The appellant was informed specifically with what he was charged. An indictment, like any other pleading, must be read as whole, and this indictment, when so read, was not in the disjunctive nor uncertain, but it clearly and in unambiguous language informed the appellant of the offense with which he was charged, and the disease which he treated. Placing the words "to wit, tuberculosis and constipation," limited the meaning of the words "disease" and "disorder" in this particular case to those diseases, and he could have been convicted for treating her of no other disease or disorder than the two named. Therefore the complaint was certain and specific in its allegations and was not in the disjunctive when read and construed as a whole. Neither was it necessary for the complaint to allege whether the disease was a mental or physical disease; all persons are aware that tuberculosis and constipation are physical diseases.

Law as to Privileged Communications

(Forrest vs. Portland Railway, Light & Power Co. (Ore.), 129 Pac. R. 1048)

The Supreme Court of Oregon says that it is only by virtue of the statute that the testimony of an attending physician or surgeon relating to the physical condition of his patient is excluded, for at common law the medical man was required to testify practically the same as any other witness. Originally privileged communications were limited to those between any attorney and client, but many statutes have been passed in the various states extending this rule to physician and patient. Some enactments impose this restriction without any qualification. Others make an exception where the patient shall definitely waive the privilege or give an express consent. Under laws of the latter sort the authorities are not in accord on the subject of what shall be deemed a consent to the examination of the attending physician. Some hold that there must be an express waiver at the time of the trial. In all the cases cited in the briefs before the court the statutes have either required an express consent to the examination of the physician, or have failed to define what is meant by the terms "waiver" and "consent," or have made no exception to the restriction. The court's attention has not been directed to any other statute, like section 734 of the Oregon laws, which provides that a party offering himself as a witness shall be deemed to have consented to the examination of a physician or surgeon on the same subject. This section stills the confusion among the precedents based on statutes not having such a provision, and gives legislative sanction to the common-sense reason that, if a party of his own accord shall withdraw the privileged veil of privacy which, for his own protection, the law has placed around the relation of physician and patient, the whole matter is thereby set at large. In this case the subject under consideration, as stated in the complaint, and the subject about which the plaintiff spoke herself as a witness, was her physical condition, including a uterine displacement and nervous injuries. In testifying on that subject, under Section 734, she consented to the examination of her physician or surgeon on the same subject.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

Albany Medical Annals

July, XXXIV, No. 7, pp. 381-444

1 *Benzol in Treatment of Leukemia, with Results in Case of Myeloid Form. J. Meyers and T. Jenkins, Albany, N.Y.

1. Benzol in Leukemia.—From a study of their own case and the cases reported, Myers and Jenkins draw the following conclusions:

Benzol is a valuable addition to the therapy of leukemia of any kind. Its institution is, however, so recent, and clinical experience with it is still so scanty, that definite conclusions as to its intrinsic value should be held in abeyance. It would seem to have no uniform action; in all cases it reduces the white cells, but in some, apparently those with very high counts, it does not reduce the leukocytes to normal, while in cases of 100,000 to 200,000 it may give brilliant results with normal white counts, greatly diminished or normal spleen, distinct gain in weight and strength, and loss of fever. On the other hand, we may have paradoxic reactions with falling white counts and gain in strength with no change in the spleen, or we may find decrease of the spleen with persisting high leukocytic counts, or there may be low counts with many pathologic leukocytes, or there may occur sudden leaps in the number of white cells. The red corpuscles and the hemoglobin are usually very beneficially influenced. When Roentgen rays can be used in combination very favorable results may be obtained, the blood returning to normal with no persisting myelocytes.

It is very probable that the results of benzoltherapy are variable for two reasons: (1) The cases in themselves vary in intensity and in the fundamental pathologic conditions or etiologic factors in the bone-marrow, the spleen or lymphoid system. (2) The results are in some way dependent on the size of the dose of benzol, which dose may be either stimulating or depressing to the tissues involved and this dose may be peculiar in a marked degree to each case or individual. The authors therefore suggest that the effect of benzol should be carefully checked by daily blood examinations so as to gage the optimum dose, and to forestall any symptoms of benzol poisoning.

American Journal of Obstetrics and Diseases of Women and Children, York, Pa.

July, LXVIII, No. 427, pp. 1-200

2 *Study of Induction and Augmentation of Labor Pains. W. E. Welz, Detroit.
3 Present Status of Cesarean Section. E. P. Davis, Philadelphia.
4 Pituitary Extract in Uterine Inertia. J. C. Edgar, New York.
5 Conservatism in Gynecology. H. C. Taylor, New York.
6 *Treatment of Sterility by Intra-Uterine Stems. R. M. Rawls, New York.
7 *Spinal Anesthesia. S. D. Jacobson, New York.
8 Unilateral Fused Kidney. A. Stein, New York.
9 *Leiomyoma of Breast. L. W. Strong, New York.
10 Famous Case of Mary Toft, the Pretended Rabbit Breeder of Godalming. C. G. Cumston, Boston.
11 Prophylaxis of Summer Diarrhea. C. G. Kerley, New York.
12 Medicinal Treatment of Summer Diarrhea. W. L. Carr, New York.

2. Induction and Augmentation of Labor Pains.—Welz believes that the inception of parturition is caused by an anaphylactic action of protein birth substances from fetus to mother and that, therefore, we are in a position to control this physiologic act. The exact substance, he thinks, will be found in some of the lower animals and then the same may be expected in man. The danger of anaphylactic shock must be kept in mind because of the possible harm to the individual who receives the injection.

6. Treatment of Sterility.—In sterility, Rawls has found that the intra-uterine stem gives as good results as the cutting operations. It causes less invalidism and is no more liable to sequelae. The intra-uterine stem is applicable to

all cases of anteflexion with abnormal cervix, except in extreme pathologic anteflexion and extreme shortening of the anterior vaginal wall. Even in those cases in which it is necessary to resort to other operations, the intra-uterine stem is a valuable adjunct. The intra-uterine stem only becomes dangerous in the hands of the unskilled and those unable to exclude inflammatory lesions. This danger applies equally well to the cutting operations or a simple divulsion and curettage.

7. **Spinal Anesthesia.**—Jacobson cites a case of acute appendicitis in which the patient was operated on successfully four days after labor under spinal anesthesia.

9. **Leiomyoma of Breast.**—The neoplasm reported by Strong occurred in a married woman 46 years old. She had noticed a tumor of the right breast which began deep in the breast four years ago; two years ago it began to enlarge. In the past six months it had occasioned some discomfort. On examination a firm, uniform tumor was felt in the upper outer quadrant of the right breast. This was freely movable under the skin and over the musculature; there was no retraction of the nipple, no ulceration and no fluctuation. The tumor outlines were not sharp but were merged with the breast tissue.

At operation a firm, fibrous tumor was found which was well encapsulated. It was situated entirely to the outer side of the nipple and separated from the nipple by its capsule. It had apparently pushed the glandular part of the breast to one side. It extended down to the fascia over the pectoralis major, and its capsule was formed in part by this fascia, so that the pectoralis itself was exposed on the removal of the tumor. The distance of the capsule from the nipple was quite appreciable so that the tumor did not arise from the region of the nipple. The tumor measured 6 by 3 cm., was oval and had a well-defined capsule of compact areolar tissue. A mass of breast tissue was received with the tumor.

On section the tumor was firm, fibrous and uniform in structure. There was a triangular cavity situated centrally, 1 cm. in its long diameter. Microscopic examination revealed a ground substance of dense hyalin connective tissue with very few nuclei. In the midst of this were irregular bundles of smooth muscle fibers generally circular in outline and of varying size. Single fibers and very small bundles also occurred. The nuclei were straight, long, with square ends, and occupied the centers of the fibers. The central space noted in the gross description appeared to be a widened lymph-space but had no distinguishable lining. Blood-vessels were scanty; the large ones lay in the stroma and had definite muscular walls which took no part in the tumor formation. Through the bundles of myomatous cells could be seen fairly numerous capillaries with distinct endothelium. The myoma cells surrounded these in a circular formation suggesting an arteriole wall, but whether the tumor took origin in that manner from the vessels or whether the cells were thus grouped for nutrition it is impossible to determine. There were many minute myomatous bundles without capillaries, showing that capillaries were not essential for their formation. An examination of the smallest muscle bundles which occurred in the areolar tissue at the edge of the tumor showed that these minute bundles were always circular, and that they often showed a central opening though without endothelium.

American Journal of Public Health, New York

July, III, No. 7, pp. 645-728

13 Diagnosis of Sick City. G. T. Palmer, Springfield, Ill.
14 Sanitary Survey. W. Rose, Washington, D.C.
15 Maggot Trap—New Weapon in Our Warfare against Typhoid Fly. E. C. Levy and W. T. Tuck, Richmond, Va.
16 Medical Statistics of Sex Hygiene; Such as They Are. J. S. Fulton, Baltimore.
17 Convenient Anaerobic Jar for Plate Cultures. S. DeM. Gage and J. H. Spurr, Washington, D. C.

Arkansas State Medical Society Journal, Little Rock

July, X, No. 2, pp. 37-65

18 Interpretation of Infant's Stools. O. K. Judd, Little Rock.
19 Plea for Better and More thorough Diagnosis by General Practitioner. C. H. Trotter, Helena.
20 Some Phases of Vaccine Therapy. E. H. Eastman, Hot Springs.

Boston Medical and Surgical Journal

July 31, CLXIX, No. 5, pp. 145-180

21 *Outdoor Treatment of Surgical Tuberculosis. R. W. Lovett, Boston, and J. E. Fish, Canton, Mass.
22 Psychopathology and Neuropathology: Psychopathic Hospital as Research and Teaching Center. E. E. Southard, Boston.
23 Some Aspects of Labor Mechanism at Pelvic Brim. A. K. Paine, Boston.
24 Roentgenoscopy of Gastric and Duodenal Ulcer. F. W. White and A. W. George, Boston.

21. **Outdoor Treatment of Surgical Tuberculosis.**—Lovett and Fish present definite figures as to the effect on children with surgical tuberculosis of living in the outdoor air. The material presented shows that even in the winter climate of New England this is not attended with risk of exciting respiratory troubles, frost bites or pneumonia. That coughs, colds and sore throats are infrequent among the children living out of doors and much less frequent than among a group of healthy boys who do not live wholly out of doors. That infectious disease has not spread among the children as easily as would have been expected. That after admission weight increases faster than in normal children and that hemoglobin also increases. That symptoms of auto-inoculation, as shown by increased temperature, are as a rule absent and the authors believe the power of resistance and repair improves under these conditions.

Cleveland Medical Journal

June, XII, No. 6, pp. 393-463

25 *Status of Roentgenology in Diagnosis of Pulmonary Tuberculosis. G. P. Thomas, Cleveland.
26 Why Western Climate Yields Poor Results for Some Tuberculous Cases. H. A. Berkes, Cleveland.
27 Tuberculous Scleritis. R. B. Metz, Cleveland.
28 Pharmacology. J. D. Pilcher, Cleveland.
29 Diphtheria Carriers. S. C. Lind, Cleveland.
30 Optic Iridectomy. L. K. Baker, Cleveland.
31 *Bronchoscope in Asthma. S. H. Large, Cleveland.

25. **Diagnosis of Pulmonary Tuberculosis.**—Thomas believes that a thorough Roentgen-ray examination is of value in cases of tuberculosis even when the other findings are positive, because it will give more accurate knowledge of the extent of the involvement; it will aid in forming a more accurate prognosis; and it will help in the choice of the proper treatment. In cases presenting a suggestive clinical history but with inconclusive or negative physical findings, the Roentgen ray is of the greatest value because it may definitely prove the presence or absence of tuberculous involvement. In such cases, no negative diagnosis is justifiable without investigation by this method.

31. **Bronchoscope in Asthma.**—One case is reported by Large that was cured by the means of the bronchoscope. In this case the patient had had nearly every possible operation on the nose and throat, but without avail. Since the treatment by the bronchoscope, he has been entirely free from asthma. Large disclaims any intention of desiring to convey the impression that the bronchoscope should be passed in every case of asthma, but if all other lines of treatment have been tried and failed, there is still one left, and that is the use of the bronchoscope.

Preliminary to the use of the instrument the parts are cocainized, either with cotton probes or with a spray, and then the sensitive areas are touched up with a 5 to 25 per cent. solution of silver nitrate or with tincture of iodin.

Indiana State Medical Association Journal, Fort Wayne

July, VI, No. 7, pp. 307-338

32 Roentgenoscopy of Gastro-Intestinal Disease. A. M. Cole, Indianapolis.
33 Case of Pemphigus Vulgaris Probably Due to Renal Insufficiency. G. W. McCaskey, Fort Wayne.
34 Case of Colonic Pain Simulating Renal Colic. S. J. Young, Indianapolis.
35 Pellagra. J. K. Pollock, Madison.

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Journal of Infectious Diseases, Chicago

July, XIII, No. 1, pp. 1-170

36 Avian Tuberculosis. E. G. Hastings, J. G. Halpin and B. A. Beach, Madison, Wis.
37 Quincy (Illinois) Typhoid Epidemic. E. O. Jordan and E. E. Irons, Quincy, Ill.
38 Identity of Entameba Histolytica and Entameba Tetragena, with Observations on Morphology and Life Cycle of Entameba Histolytica. C. F. Craig, U. S. Army.
39 Investigations of Etiology of Infectious Abortion of Mares and Jennets in Kentucky. E. S. Good and L. S. Corbett, Lexington, Ky.
40 *Serum Studies in Pneumonia. C. C. Hartman, Pittsburgh.
41 New Precision Syringe for Accurate Injection of Small Quantities; Holder for Such Syringes and for Other Purposes. M. C. Terry, San Francisco.
42 Botany of Organism of Blastomycosis. R. C. Whitman, Denver.
43 Natural Hemolysins in Rabbit Serum. J. A. Kolmer and W. W. Williams, Philadelphia.
44 Some Immunity Reactions of Edestin. B. White and O. T. Avery, New York.
45 *Rôle of Staphylococcus in Gonorrhea. C. C. Warden, Los Angeles.
46 Nitrite Destruction as Presumptive Test for Determination of Water Pollution. F. Maltaner, San Francisco.
47 *Some Chemical Conditions Influencing Acid-Proofness and Non-Acid-Proofness in Saprophytic Culture of B. Tuberculosis. W. H. Wherry, Cincinnati.
48 Effects of Desiccation of Virus of Rabies and Use of This Material in Immunization. D. L. Harris, St. Louis.
49 *Effect of Quinin on Rabies in Dogs. V. H. Moon, Chicago.

40. Serum Studies in Pneumonia.—Fibrin, in some instances, Hartman says, appears to be able to bind complement in the presence of serum, but the results are so irregular that they cannot be considered to be specific. Nevertheless, it is the indication of a process, the object of which is the digestion or lysis of the fibrin. Looking at it from the standpoint of auto-antibody formation, it is possible to view it as a reaction on the part of the body to rid itself of one of the products of its own manufacture. As such, fibrin does not exist in the body normally and may, perhaps, on this account, act as foreign material. When the antibodies arrive in sufficient strength, the fibrinolysis begins, by the aid of complement furnished by the blood-serum or leukocytes. Though the body might exhibit marked power to destroy or decompose the fibrinous exudate, in some instances, it may not possess the same ability to deal with the decomposition products.

The fact that a certain number of the "normal" serums in Hartman's experiments reacted with certain specimens of fibrin is of interest, indicating the presence of substances in the serum similar to that found in a few pneumonia serums. He suggests that it is possible that these reactions are not specific but are the evidence of a previous inflammatory process of a fibrinous character. The fact that the remains in non-resolution are principally fibrinous rather than cellular indicates an absence in the body of the means of removing this portion of the exudate. If the disappearance of the fibrin be entirely due to the enzyme action of the leukocytes and of the exudated serum, it seems strange that autolysis or digestion of the exudate, except the fibrin, should go on to completion or near completion, in some cases of non-resolution, leaving the fibrin intact. It rather indicates the participation of something else in addition to the autolysis or digestion by leukocytic enzymes. Whether this persistence of the fibrin is due to a lack of preparation or "sensitization" to lysis similar to the opsonic reaction, or to an inherent anti-enzymotic action, or a lack of something in the body fluids designed especially to remove the fibrin, is not apparent. Though it would appear that a common process brings about the removal of the entire exudate, nevertheless, a persistence of the fibrin in spite of the disappearance of much or all of the associated exudate in some instances, points toward a process differing from that of a leukocytic digestion, though perhaps working in association with it. The inability to immunize rabbits against fibrin is interesting as indicating that the tissues of this animal do not react to whole fibrin. A greater number of attempts with various technics would be necessary, however, to demonstrate this more fully. It was shown by the methods used that there was no ability conferred on the serum to decompose the fibrin.

45. Staphylococcus in Gonorrhea.—Warden submits evidence suggesting the following tentative conclusions: Many, if not all, of the Gram-negative, intracellular biscuit or coffee-bean-shaped cocci observed in the purulent discharge in acute gonorrhea, which are regarded as gonococci and which serve as criteria of diagnosis, are not gonococci, but belong to the staphylococcus group. The provisional designation *Staphylococcus urethrae* is suggested for this coccus. True gonococci are demonstrable with difficulty or not at all in smears of gonorrheal exudates or in preparations of tissues. Gonorrhea may be due to a double infection and dependent on a microbial symbiosis. Diagnosis of gonorrhea rests on cultural methods only. The old criterion, the microscopic appearance of smears, is unreliable.

47. Saprophytic Culture of B. Tuberculosis.—During a study of the growth of a saprophytic culture of *B. tuberculosis* in various synthetic mediums, Wherry observed that the morphology varied from minute coccoid bodies to short or long, thick or thin, straight or curved rods which were or were not acid-proof according to the conditions of growth. The culture could be rendered non-acid-proof by continual growth under conditions unfavorable to the synthesis of fats. The culture could synthesize fatty bodies rendering it acid-proof when such substances as acetates were the source of carbon and nitrogen; or from various ammonium salts and propyl alcohol; or from NH_4Cl and mannite; or from NH_4Cl and levulose, or from glycerin and glucose in the presence of peptone. Various carbohydrates and the alcohol mannite were not attacked in the absence of phosphates. Various phosphates other than KH_2PO_4 favored fermentation, but acid-proof rods developed only in cultures containing NH_4Cl and levulose in the presence of potassium dihydrogen phosphate, calcium phosphate (secondary and tertiary), sodium biphosphate (primary), sodium pyrophosphate, and to a lesser degree in the presence of sodium phosphate (secondary). Under the conditions of the experiments the spore-like bodies produced were killed by heating to 60 C. for thirty minutes. That is, they were killed unless they require some very special conditions for germination. From the results of vital staining Wherry concludes that the chemical composition of these artificially produced acid-proof tubercle bacilli is different from that of virulent tubercle bacilli.

49. Effect of Quinin on Rabies in Dogs.—Of three dogs treated by Moon, two are alive and healthy and one died of obscure cause two and one-half months after treatment. The control animals in every case died with the characteristic symptoms and pathologic changes of rabies. The dogs were inoculated with rabid brain material and allowed to develop active symptoms of rabies. The technic of inoculation was as follows: A portion of the hippocampus or cerebral cortex of a rabid animal was rubbed into an emulsion with normal salt solution. With a small needle a few drops of this emulsion were then injected into and around the ulnar nerve at the elbow or a long, slender needle was inserted in the lower conjunctival sac below the eyeball and extended back until the point entered or passed through the optic foramen. The injection was thus made directly into the optic tract, or subdurally. The latter method of course necessitated the employment of general anesthesia, but the results were more uniform than by the other method, and the incubation period shorter.

When active symptoms of rabies developed, as unusual excitability, restlessness, changed quality of the bark, decreased appetite, sometimes difficulty of swallowing, muscular spasms, paralysis of the legs, etc., the dog was given very large doses of quinin sulphate several times daily, while another dog inoculated at the same time and under the same conditions was allowed to go untreated as a control. The quinin was administered in capsules around which was stitched a thin covering of fresh tough meat as from the flank of beef. The dog would usually bolt these without chewing, but if he became unable to swallow, as happened several times, the same quantity of quinin bisulphate was given in solution hypodermically. The daily amount given a 6 or 7 kilogram

dog was from 1.0 to 1.6 gm., usually in three doses. This is equivalent to from 12 to 18 gm. daily for an average man, in proportion to the body weight. The medication was thus pushed to the limit to secure the full physiologic, bordering on toxic, effect. The idea was that in order to test thoroughly the effect of quinin, the system should be kept saturated with it. No ill effects followed, and the results seem encouraging.

Medical Record, New York

August 2, LXXXIV, No. 5, pp. 185-230

50 Newer Aspects of Treatment of Epilepsy. L. P. Clark, New York.
51 Disease and Genetics. R. G. Eccles, Brooklyn.
52 Differentiation of Erythema of Scarlet Fever and That of German Measles. Diagnosis. S. D. Hubbard, New York.
53 Lobar Pneumonia. E. E. Cornwall, Brooklyn.
54 Obsessions in Medicine. B. Robinson, New York.
55 Tumor of Omentum with Twist of Pedicle, Giving Symptoms of Acute Appendicitis. C. Legiardi-Laura, New York.

Michigan State Medical Society Journal, Grand Rapids

July, XII, No. 7, pp. 355-502

56 Experiences in Surgical Treatment of Ulcers and Carcinoma of Intestinal Tract. C. A. Hamann, Cleveland.
57 Hyperthyroidism, Its Medical and Surgical Treatment. F. B. Marshall, Muskegon.
58 Liabilities of Physician and Surgeon to Public. O. E. Chase, Traverse City.
59 Case of Puerperal Septicemia. G. M. Johnson, Battle Creek.
60 Ankylosis of Hip Arthroplasty. H. N. Torrey, Detroit.
61 Case Report of Fractured Vertebrae. F. C. Kinsey, Grand Rapids.

New York Medical Journal

August 2, XCVIII, No. 5, pp. 209-256

62 Twenty Cases of Inflammatory Affections of Labyrinth. W. C. Phillips, E. P. Fowler, S. J. Kopetzky and J. C. Sharp, New York.
63 *Pellagra, Surgery, the Colloids, and Strong Drugs. H. Shoemaker, Shelby, N. C.
64 New Pocket Clinical Sphygmomanometer. L. N. Boston, Philadelphia.
65 Mental Symptoms of Renal Insufficiency. W. B. Cornell, Baltimore.
66 Surgical Aphasia. W. L. Chapman, H. A. Morris and G. W. Simrell, Brooklyn.
67 Chronic Appendicitis in Its Relation to Hyperacidity of Gastric Juice. H. Illoway, New York.
68 Acute Retropharyngeal Abscess. I. H. Alexander and H. Montague, New York.
69 Immunity by Scientific Bacterination versus Natural Immunization in Self-Limiting Diseases of Bacterial Origin. C. G. Roehr, Fort Pierce, Fla.
70 Gelatin and Olive Oil in Liberal Diet of Typhoid. I. Bram, Philadelphia.
71 Efficiency and Health. S. H. Brown, Philadelphia.

63. **Pellagra, Surgery, Colloids, Etc.**—Shoemaker regards pellagra as a medical disease which may at times be relieved by surgical interference. Gall-bladder drainage with appendectomy, he says, is the operation of election, and may have a twofold effect on the disease. Early in the disease some patients have a slight catarrhal jaundice. As the gall-bladder is a very suitable reservoir for many microbes, it is possible the pellagra germ may lurk here. At least drainage of the gall-bladder relieves the pancreas and upper bowel while the mere presence of a drain sets up a leukocytosis over a number of days. Appendicostomy has been done with success in pellagra, but aside from the benefit of a continued leukocytosis, the drainage is not high enough in the intestinal tract to be of service.

Any surgical procedure on pellagrins has been attended with success by Shoemaker. First, he has put the patient in a way to complete health, and, second, he has stimulated the hematopoietic organs to such an extent that the patients have escaped one year without a return of pellagra. Three cases relapsed immediately following operation and two others became insane—operated on for cancer of uterus—and relapsed. All are in good health to-day. Shoemaker believes that they owe their recovery from pellagra to a leukocytosis surgically incited.

Shoemaker has given about four hundred intravenous injections of metals, metallic colloids electrically prepared, and organic colloids of metals. Chief of these are antimony, copper, selenium (Wassermann), silver, arsenic and iron. Antimony, copper, arsenic and iron have been used in pellagra; copper and selenium in inoperable cancer; arsenic in syphilis, and iron in tuberculosis, etc. The most electrically positive metals, such as copper, provoke the greatest disturbance—the so-called reaction.

Clinically this reaction begins shortly after the administration of a colloid. In the electrically prepared metallic colloids a chill began forty-five minutes subsequent to administration, accompanied by a rise of temperature to 102 to 104 F., and a corresponding acceleration of the pulse, headache, nausea and sometimes emesis. On examination of the blood before, during and after this chill a pronounced leukocytosis is seen to begin, increase and disappear with the temperature curve.

Shoemaker has been able to produce at will a leukocytosis of from 15,000 to 20,000 within forty-five minutes of the administration of the drug. In nine hours the leukocytosis has disappeared. When the first reaction is provoked the polymorphonuclear leukocytes are 98 per cent. of the entire differential count. As the use of strong reactions is continued, the small mononuclear leukocyte enters the count in increasing proportion; with still more injections the large mononuclear leukocyte begins to occur more frequently; and if the use of the colloid is continued, large mast and bone marrow cells make their appearance. Finally a decrease in the red cells is noted and a few irregular red blood-cells appear—poikilocytosis. Here Shoemaker has terminated the use of electrically prepared colloids. The phenomenon within the polymorphonuclear leukocyte is interesting. The chromatin has lost its usual resting shape and is unraveled like a skein of yarn and thrown into loops, ovals and giant peripheral rings, generally open at one place. The cytoplasm is clear and very translucent. Clinically, the patients improve in well being. A muddy copper colored skin soon begins to show a healthy flush; there is a gain in weight. Shoemaker believes that flies, jiggers and other insects carry the infecting mite of pellagra.

Northwest Medicine, Seattle, Wash.

July, V, No. 7, pp. 179-208

72 Scarlet Fever, Diagnosis and Complications. C. St. Leede, Seattle, Wash.
73 Further Studies of Indicanuria. G. Baar, Portland, Ore.
74 Medical Sociology. C. E. West, Salina, Utah.
75 Systemic Factor in Eye-Strain. C. T. Cooke, Seattle, Wash.
76 Uterine Dystocia, Secondary to Mitral Stenosis. A. Ries-Finley, Ogden, Utah.
77 Business Side of Medicine. R. S. Joyce, Ogden, Utah.

Old Dominion Journal of Medicine and Surgery, Richmond, Va.

July, XVII, No. 1, pp. 1-54

78 *Differential Blood-Counts in Three Cases of Pellagra. J. Bardin, Richmond, Va.
79 Shrines, Relics, Incubation and Amulets in Medicine. P. S. Roy, Washington, D. C.
80 Sanitation in Small Towns. W. Egleston, Hartsville, S. C.

78. **Differential Blood-Counts in Pellagra.**—The three cases presented by Bardin were all negroes, females, and all of them under 30 years of age. In the spring and summer of 1912 all three presented symptoms of about equal intensity and of rather severe nature. The nervous and cutaneous manifestations were especially well marked and characteristic. With the onset of cold weather, the symptoms in all three cases were greatly ameliorated, and at the time at which the blood-counts were made in the fall, they had practically disappeared.

Study and comparison of the summer and fall counts in the three cases bring out the following points: In the active stages of the disease there is a constant increase in the lymphocytes, large and small; this increase is generally at the expense of the polymorphonuclear neutrophils. In the cases under review, there is a persistence of approximately the same blood-picture as in the active stages, after the other symptoms have practically disappeared. The persistence of the relative lymphocytosis probably has a prognostic significance, as indicating a probable recurrence of active symptoms with the return of the warm weather.

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Ophthalmic Record, Chicago

July, XXII, No. 7, pp. 349-406

81 Case of Spring Catarrh: Pathologic Report. H. McKee, Montreal.
82 Two Cases of Snow-Blindness. G. H. Mathewson, Montreal.
83 Two New Cross-Cylinder Holders. J. N. Rhoads, Philadelphia.
84 Case of "Optic Atrophy Caused by Uterine Hemorrhage." F. P. Calhoun, Atlanta, Ga.
85 Heterochromia Iridium. C. Williams, Philadelphia.

Ophthalmology, Seattle, Wash.

July, IX, No. 4, pp. 479-646

86 Physiology of Hypophysis Cerebri. S. Simpson, Ithaca, N. Y.
87 Value of Gallemaert's Magnetometer in Diagnosis of Intra-Ocular Foreign Bodies. M. Danis, Brussels, Belgium.
88 Absorption of Lens Nucleus in Patient, Aged 66 Years. W. H. Dudley, Los Angeles.
89 Five Cases of Senile Cataract Treated by Subconjunctival Injections of Potassium Iodid. W. E. Scott-Moncrieff, Victoria, B. C.
90 Two Cases of Lacrimal Cysts. J. Santos-Fernandez, Havana, Cuba.
91 Corneal Fistulas and Iridectomy. S. Bey, Cairo, Egypt.
92 Surgical Treatment of High Myopia. W. E. Lambert, New York.
93 Education of Blind. O. H. Burritt, Overbrook, Pa.
94 Subconjunctival Injections of Cyanid of Mercury in Ophthalmology. C. B. Meding, New York.
95 Central Scotoma and Blind Spot Anomalies—Their Clinical Significance. P. Fridenberg, New York.
96 Further Experiences with Sclerotomia Cruciata Multiplex (Grill-Like Sclerotomy.) M. Wicherkiewicz, Krakau.
97 Modified Electric Bulb. J. C. Hancock, Brooklyn.
98 Management of Hyperreso- and Hyperexophoria. E. E. Gibbons, Baltimore.

South Carolina Medical Association Journal, Seneca

July, IX, No. 7, pp. 189-199

99 Surgery and General Practitioner. H. A. Royster, Raleigh, N. C.
100 Importance of Accurate Diagnosis of Affections of Eye. C. W. Kollock, Charleston.

Surgery, Gynecology and Obstetrics, Chicago

July, XVII, No. 1, pp. 1-136

101 Roentgen-Ray in Diagnosis of Gastric Ulcer and Its Sequelae. E. W. Mills, St. Louis, and R. D. Carman, Rochester, Minn.
102 Problems of Obstetric Practice. W. W. Chipman, Montreal.
103 Malignancy of Giant Cell Sarcoma. J. C. Stewart, Minneapolis.
104 Abbot Treatment of Rotary Lateral Curvature of Spine and Details of Technic. S. Kleinberg, New York.
105 *Benign and Malignant Ovarian Cysts. W. C. MacCarty and W. E. Sistrunk, Rochester.
106 Literature and Case Reports of Ruptured Uterus. C. H. Davis, Chicago.
107 Abdominal Pregnancy with Living Child. J. S. Horsley, Richmond, Va.
108 "Pericolic Membrane" of Broad Ligament. A. E. Hertzler, Kansas City, Mo.
109 *Lengthening Shortened Bones of Leg by Operation. P. B. Magnuson, Chicago.
110 Description of Enteroptotic Woman. R. R. Smith, Grand Rapids, Mich.
111 How Can Surgeon in Civil Life Best Serve His Country in Time of War? C. F. Stokes, Washington, D. C.
112 *Interesting Bacteriologic Finding in Case of Pemphigus. E. S. Hendry, Baltimore.
113 Decompression in Case of Severe Intracranial Tension with Failing Circulation: Experimental Study. C. H. Frazier and A. B. Eisenbrey, Philadelphia
114 Experimental Study of Unilateral Hematuria of So-Called Essential Type. R. L. Payne, Norfolk, Va., and W. D. MacNider, Chapel Hill, N. C.
115 Retrograde Incarcerated Hernia: Hernia "En W." L. Friedman, New York.
116 Study of Pituitrin. N. S. Heaney, Chicago.
117 *Three-Finger Fluctuation. W. S. Handley, London.
118 Postoperative Complications of Prostatectomy. F. R. Hagner and H. G. Fuller, Washington, D. C.
119 Infiltration of Lingual Nerve for Operations on Tongue and for Relief of Pain in Inoperable Carcinoma. P. G. Skillern, Philadelphia.
120 Continuous Suction and Its Application in Postoperative Treatment. J. [illegible] Kenyon, New York.
121 Intratracheal Ether Anesthesia. I. D. Kruskal, Brooklyn.
122 Self-Retaining Retractor for Use in Perineorrhaphy. L. Friedman, New York.
123 *Method of Ventrofixation Combined with Certain Tubal Sterilization by Means of Extra-Abdominal Displacement. D. Stetten, New York.

105. Benign and Malignant Ovarian Cysts.—The authors examined 1,000 specimens. The various tumors occurred in the following frequency: (1) hemorrhagic cysts, 214; (2) non-hemorrhagic cysts, 451; (3) papillary and carcinomatous cysts, 163; (4) dermoids, 98; (5) parovarian cysts, 74. The principal distinguishing feature in ovarian cysts is the lining epithelium. This is apparently differentiated or specialized and is most important. Three different linings are seen, viz.: round or oval many-layered epithelium, columnar epithelium, high or low, and lutein cells. These three types of cells have apparently three different functions. Whether or not the columnar epithelium and the many-layered epithelium may develop from each other is unknown. The only indication that this may be possible is the presence of both types in the same cyst.

On these fundamentals all neoplastic cysts of the ovary are classified and described. The simplest cyst possesses a wall, the inner surface of which is smooth and is composed of from two to six layers of small oval or round epithelial cells. The content of such a cyst is a clear fluid. When a Graafian follicle ceases to be a follicle and becomes a simple cyst of this description is not known. That such cysts originate from Graafian follicles is to be strongly suspected, because they have a similar lining and contain apparently the same clear fluid. The secondary descriptive features of simple cysts consist in their being unilocular or multilocular, and whether or not hemorrhage has occurred into the wall or into the interior. Cystadenomas are cysts which are lined by columnar or cuboidal epithelium and which contain a highly albuminous, pseudomucinous or gelatinous material. They may be single or multiple. They may present hemorrhage into the cavity of the cyst or into the wall. The epithelial lining may be hyperplastic and thrown into folds or papillomas, which have connective tissue pedicles and are covered with epithelium, which is continuous with that which lines the cyst. Such papillomatous neoplasms may be intracystic or extracystic. The extracystic papillomas are the result of destruction of the wall of the cyst and growth into the abdominal cavity. The epithelium of ovarian cyst adenomas, like that of the breast, does not always produce intracystic papillomas. On the contrary it may grow into the underlying tissue and present itself as a true adenocarcinoma, thus forming a solid mass in the walls of cysts.

Hemorrhagic cysts of the ovary have different characteristics. They may be hemorrhagic simple cysts, hemorrhagic cystadenomas or large corpora lutea. The differentiation between these grossly has been impossible in the writers' experience. The clinical significance of all ovarian cysts, i. e., the simple cysts, the simple papillary and carcinomatous cystadenomas, and the hemorrhagic cysts, depends on the life history of their lining epithelium. Ordinarily the Graafian follicle should run its natural course, discharge its ovum, and recede with the formation of a corpus luteum. In case the Graafian follicle continues to develop instead of rupturing and forming a corpus luteum, a so-called simple cyst occurs with the characteristics described above. Experience demonstrates that malignant ovarian cysts do not possess epithelium of the type which one finds to be the dominating type in simple cysts. Their morphologic sign of malignancy is the irregular hyperplasia of the columnar epithelium of the cystadenomas. In the writers' experience, all carcinomatous and papillomatous cysts have apparently originated from cystadenomas. Cystadenomas in the ovary bear a certain resemblance to cystadenomas in the breast. This is especially true in the light of hyperplasia of the lining epithelium. In the case of the normal hyperplastic mammary epithelium one finds two distinct layers, the inner layer of which is absent in cystadenomas and carcinomas. In ovarian cystadenomas and carcinomas the same phenomenon is true. During extensive hyperplasia the inner row disappears.

In view of these facts, certain clinical and operative questions arise. (1) When operative procedure consists of artificial rupture of a cyst without removal, what are the chances of rupturing a cystadenoma? This question may be answered by saying that small ovarian cystadenomas occur in a hemorrhagic or non-hemorrhagic state, and that their differentiation from simple hemorrhagic or non-hemorrhagic cysts is determinable only by the microscope. (2) Would the artificial

rupture of a small ovarian cystadenoma prevent further development? This is important, but is unanswerable at present. Experience teaches that large cystadenomas, however, certainly continue to develop after rupture. In young individuals with cystic ovaries which the surgeon ordinarily removes or punctures, would it not be more conservative to determine the exact microscopic nature of a portion of the cyst wall during operation? By so doing a simple cyst may be ruptured without destruction of an ovary and cystadenomas will not be left in an attempt to conserve ovarian tissue.

109. **Lengthening Shortened Bones of Leg.**—Magnuson says that a shortened femur may be lengthened from two to three inches without any interference with blood and nerve supply, excepting in cases in which there is a large amount of old inflammatory tissue which would limit the stretching of the blood-vessels and nerves, or which might produce kinking. Ivory, being an animal matter, is entirely absorbed by the tissues, does not act as a foreign body in bone, does not cause necrosis or slough out as do most other materials. Ivory screws may be cut off flush with the shaft of the bone, leaving nothing to project into or irritate the soft parts. There is no flange or shoulder on the screw to prevent it from entering to its full length. The method of application insures the screw fitting accurately into the hole made for it, since a tap is put through first; the deep thread into the bone insures a good hold, prevents any lateral motion, and the absorption of fluids by the ivory insures that in twenty-four hours the screw will fit so closely that it will not allow the slightest motion between the fragments. No great force is needed to drive the screws in, and eventually they will be absorbed, leaving the healed bone without defect. In case of infection after the operation the ivory will not be absorbed until the suppuration has ceased. Lengthening bones would be of benefit in shortening after fracture, faulty development, or injury to the epiphysis before full growth is reached. The amount of extension obtained in these experiments was from three-eighths to one-half inch in dogs about the size of a fox terrier, without the slightest injury to blood-vessels or nerves, making it seem very probable that from two to three inches may be obtained in a bone as long as the average human femur, without any serious after-effects. It is stated here that the method of sterilization of the ivory screws which Magnuson has found best is saturated solution of bichlorid of mercury in alcohol, placed in the autoclave, under high steam pressure, for four hours. If these ivory screws are boiled they become warped and useless.

112. **Bacteriologic Finding in Pemphigus.**—Hendry reports on the isolation of an anaerobic bacillus from the vesicles and treatment of the disease by an autogenous vaccine. A further report is promised.

117. **Three-Finger Fluctuation.**—The method described by Handley consists essentially in the artificial production of a true expansile impulse in an inelastic bag containing fluid. The tips of the two forefingers and of the middle finger of the left hand are firmly planted on the swelling, marking out an equilateral triangle of an area rather smaller than the limits of the swelling. The right forefinger is next sharply pressed into the swelling at right angles to its surface. Fluctuation is present only if the two fingers of the left hand move away from each other horizontally in the plane of the skin at the moment when this is done. Any movement of the fingers in a vertical direction is to be ignored.

123. **Method of Ventrofixation.**—A median laparotomy is performed by Stetten and the round ligaments are ligated about 2 inches from the uterus. They are divided proximal to the ligatures and freed from the broad ligaments up to the uterine cornua by a few snips of the scissors. The peritoneal edges of the incisions in the broad ligaments are united by a running catgut suture. Ligatures are now passed through the broad ligaments between the tubes and ovaries, and the tubes are freed to their uterine attachment. The freed round ligaments and tubes are now brought through a stab wound of the fascia, muscle and peritoneum on either side, three-quarters of an inch away from the edge of the abdominal incision. They are drawn taut and fixed to the fascia with a catgut suture. The peritoneum is closed with continuous catgut, one stitch passing through the fundus of the uterus, the surface of which has been scarified. The muscle and fascial layers are closed in the usual manner with interrupted chromic gut sutures. The excess of tubes and round ligaments is removed and the tubes are ligated, the stumps being cauterized with a Paquelin. Enough of the tubes and ligaments should be left so that they overlap in the median line. They are stitched to the fascia and to the structures of the opposite side with a few sutures of catgut. The skin wound is closed completely.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Children's Diseases, London

July, X, No. 115, pp. 289-336

1 Case of Severe B. Coli Infection of Urinary Tract; Nephrectomy; Recovery. H. W. Wilson.
2 *Case Simulating Meningitis due to Escape of Thread-Worms into Peritoneal Cavity through Perforated Appendix. R. N. H. A. Whitelocke.
3 *Treatment of Diphtheria-Bacillus Carriers with Bouillon Cultures of Staphylococcus Pyogenes Aureus. J. D. Rolleston.
4 Malted Food in Treatment of Enteritis in Young Children. S. Veras.

2. **Case Simulating Meningitis.**—A girl, aged 5½ years, was admitted to the hospital with the diagnosis of tuberculous meningitis. A year previously an enlarged lymph-node had been removed from the side of her neck. She seemed very ill, had a temperature of 102.4 F. and a pulse-rate of 112. There was marked converging strabismus, with contraction of both pupils and some photophobia. For thirty-six hours or more she had been sick, was restless, and now and then screamed out when apparently dozing. She was very constipated and an enema had produced but a small result. She slept badly and often refused food; any attempt at drinking brought on immediate vomiting. She had urinary incontinence. There was no disease of the ears or air-sinuses. After two days she began to pick at the bedclothes, to throw herself about in bed in a restless, irregular manner, and to wet herself frequently. At this period, Whitelocke noticed for the first time that she kept her right lower limb fully flexed and drawn up to the abdomen, while she moved the left from time to time, often extending it. Palpation of the lower abdomen gave the impression of increased rigidity in the right rectus muscle, and caused her to call out when even gentle pressure was brought to bear over the cecum. There was no distinct dulness on percussion anywhere.

When the peritoneum was opened a small quantity of semipurulent fluid escaped, emitting a fecal odor. An inflamed process of omentum was found covering in the anterior surface of the cecum and the appendix completely. In peeling the inflamed omentum from the appendix Whitelocke came on a colony of about a dozen dead thread-worms. After the appendix had been cleared and delivered through the wound it was found to possess a pin-point perforation ¾ inch from its distal extremity on its mesial aspect. Through the minute perforation a living thread-worm was to be seen wriggling until it finally extruded itself on to a swab held to receive it. In quick succession three or four others of smaller size, and presumably of less mature age, passed in single file through the opening. The base of the appendix was crushed and ligatured, and the organ excised according to custom. The omentum was then drawn into the wound and carefully examined, and as a result three more live worms were removed from its meshes at some distance from the inflamed and previously attached portion. In swabbing the pelvic peritoneum with hot saline in search for others, four more live ones were caught and removed. The wound was then closed. The appendix when cut open was found to be crammed full of oxyurides of all sizes and ages. The very small and immature worms greatly predominated. The mucous membrane was considerably ulcerated, especially in the immediate neighborhood of the perforation. The opening was so small that a

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fully grown oxyuris squeezed itself through with decided difficulty. After the operation the nervous symptoms and sickness very soon disappeared, the pulse and temperature fell to normal on the following day, and from this time onward the recovery was rapid and complete.

3. Treatment of Diphtheria Bacillus Carriers.—Ten chronic diphtheria bacillus carriers were treated by Rolleston by spraying and swabbing the throat or nose with a bouillon culture of *Staphylococcus pyogenes aureus*. In six faucial cases the findings became negative within two to seven days after starting the treatment. In two nasal cases the treatment was ineffective. In all but two cases a mild form of sore throat was produced, but no complication ensued.

British Medical Journal, London

June 19, II, No. 2742, pp. 109-156

5* Conservative Treatment of Tuberculosis of Joints. W. S. Fenwick.
6 The Profession, Public and Insurance Act. R. L. Langdon-Down.
7 Medicine and Eugenics. J. Cowper.
8 *Case of Perforated Common Bile Duct followed by Subphrenic Abscess, Operation and Recovery. C. Campbell-Horsfall.
9 Pellagra in Great Britain. L. W. Sambon.
10 Nodular Leukemia. G. R. Ward.
11 Case of Ectopia Cordis. W. Rolland.

5. Treatment of Tuberculosis of Joints.—Speaking of the use of tuberculin in joint cases, Fenwick says he is convinced of the value of the administration of tuberculin in all cases of surgical tuberculosis, unless the infection with the bacilli is so grave as to cause a highly oscillating temperature or other grave signs. No case of tuberculosis should be operated on without a preliminary course of tuberculin, as this will help to guard against those distressing cases of general tuberculosis arising after operation. Tuberculin must not, however, be regarded as more than a useful adjunct. Alone it will not cure. All other means at our disposal should also be employed. The methods of administering tuberculin are by hypodermic injection and by the mouth. The former is obivously the more scientific, and the latter has been generally condemned as of no value. Nevertheless, it is a method that Fenwick has employed as a routine in the outpatient department, and he speaks of it in the highest possible terms. It has the merit of extreme ease of administration.

Fenwick has three bottles made up with normal saline containing in each ounce 1/1,000, 1/100 and 1/10 mg. of T.R.; 1/2 per cent. phenol helps to preserve the solution. He commences by giving a child 3j of the weak solution, or 1/8,000 mg., and the next week doubles the dose provided there has been no rise of temperature. In the outpatient department he rarely increases the dose beyond 1/100 mg., as supervision is not easy. He believes strongly in small doses to begin with, gradually increased and continued over a long time. He has never seen any harm result. As a rule, after one or two doses the appetite and color are better, and the lesion shows slight improvement.

8. Perforation of Common Bile Duct.—The patient whose history Campbell-Horsfall reports was a married woman, aged 45, had suffered for years from dyspepsia and spasmodic pains which were at times intense and radiated over the upper abdomen and chest. Campbell-Horsfall saw her during two attacks, which, he says, were unmistakably due to gall-stones, and it was during the last of these that the catastrophe occurred which is the basis of this note. The patient had been seized with intense pain in the chest and upper abdomen and signs of common duct obstruction, jaundice, bile-stained urine, pale stools and a moderate degree of fever. She had consented to operation, and this was to take place as soon as the acute symptoms had subsided. Suddenly she became quite immobile, pale and cold, pulse 120 and temperature 100 F., was seized with an agonizing pain causing her to jump out of bed, and then collapsing. There was no rigidity of the abdominal muscles, nor was there any marked tenderness. Deep pressure in the region of the gall-bladder produced a well-marked diaphragmatic grunt. The following day there was moderate distention of the abdomen; pulse 120, but temperature falling. From the anamnesis Campbell-Horsfall concluded the common duct had ruptured.

On opening the peritoneum bile-stained fluid and pus welled up into the opening. After shutting off the peritoneal cavity an exploration was made of the biliary region, and although one could trace the stream of bile and pus down to the region of the common duct, the actual tear could not be located; the gall-bladder was shrunk. A rubber drain was carried down to the common duct and a cigarette drain placed in the right kidney pouch. An incision was next made over the pubes, and Douglas' pouch was found filled with bile-stained fluid; this was gently mopped away and a tube inserted. The visceral peritoneum did not show any marked inflammatory action. The pulse was much better after the operation, and the patient was put back to bed in the Fowler position and proctoclysis commenced. She quickly rallied from the operation. Next day she was fairly comfortable, but looked blue and the skin leaky. As there had been no vomiting and she was very thirsty cold water was allowed freely. The tubes were removed on the fifth day.

The day following she complained of pain in her left side; the temperature went up to 103 F., and pulse 112. A definite fluctuating mass could be made out on the left side. The same evening under ether Campbell-Horsfall evacuated a large collection of bile-stained material from this side and inserted a drain. There was a good deal of shock after this, but under salines the pulse recovered and the patient seemed much easier. The temperature fell, but the pulse still remained rapid. In spite of this her condition was not satisfactory, respiration became more frequent, the upper part of the abdomen ceased to move and on March 25 there was distinct evidence of another collection of matter in the upper abdomen. Under ether an incision was made through the left upper rectus, and at once he came on a large accumulation of biliary matter, together with a quantity of mucus similar to the contents of the small intestine. The cavity could be traced up under the diaphragm toward the right side. A large drainage tube was put in and a counter-opening made in the left flank, with through-and-through drainage. Almost at once there was a marked improvement in the patient's condition, and this continued. During this time she had an attack of pain, evidence of renewed blocking of the common duct, but whatever the cause it quickly subsided, and with the exception of some fluid in the left chest (which has now disappeared) her convalescence has been uneventful, and she is now in better health than she has been for many years past, and instead of denying herself foods is able to eat and digest anything.

Journal of Ostetrics and Gynecology of British Empire, London

June, XXIII, No. 6, pp. 353-442

12 *Esthiomene, or Lupus Vulvae: Historical Pathologic and Clinical Study with Analysis of Six Cases. L. Kurz.
13 *Menstrual Molimina: Adult Cases. C. Chisholm.
14 Adenocarcinoma of Body of Uterus in Association with Adenomyoma Diffusum Benignum. H. Littlewood and M. J Stewart.

12. Esthiomene.—An analysis of six cases and of the literature published on the subject leads Kurz to the conclusion that esthiomene is a manifestation of tertiary syphilis and that the syphilitic virus is the sole cause of the condition. There are a number of accessory factors that have a marked influence on the course and appearance of esthiomene, but Kurz does not see how they could be mistaken for the causes of a state which, considered from every possible point of view, bears the stamp of syphilis. Such accessory causes are inflammation, abscesses, uncleanliness and above all a low state of health aptly termed by the French *"la misère physiologique."* A case of esthiomene is occasionally met with which may at the outset simulate tuberculosis, cancer or indurative elephantiasic edema. Such cases are, however, rare, and a careful inquiry into the history of the case cannot fail to enlighten the student regarding the class of disease to which such a case should be relegated. When a

portion of tissue can be removed for examination a first glance through the microscope reveals the true nature. A positive Wassermann reaction will confirm it. The majority of early cases of esthiomene respond to antisyphilitic treatment. The late and chronic cases which do not respond do not indicate that esthiomene may at times be due to other causes than syphilis; there are many tertiary lesions, such as strictures and leukoplakia and others which do not yield to the usual antisyphilitic remedies and which are none the less due to syphilis.

13. **Menstrual Molimina.**—Chisholm says passive hyperemia of the pelvic organs appears to be the cause of much local pain. This is relieved in the majority of cases in the first day after onset of menstruation. Unhealthy hygienic conditions and mode of life contribute to lowering the general nervous system so that pain is readily felt and a habit of pain at the menstrual period formed. Nervous symptoms, reflex and vasomotor, are often associated with secondary menstrual discomfort. Except in a very small minority of cases this menstrual discomfort does not affect the woman's capacity for carrying on her ordinary work. Any appearance or development of mentrual pain shows a pathologic condition whose cause, whether local or general, ought to be investigated and treated before the discomfort becomes established as a regular habit.

Lancet, London

July 19, II, No. 4690, pp. 125-198

15 Early Diagnosis and Treatment of Pulmonary Tuberculosis. J. M. Bruce.
16 Three Cases of Carcinoma of Umbilicus in Adults. A. E. Barker.
17 Twelve Cases of Paratyphoid Fever Associated with Epidemic of Typhoid. J. Watt.
18 Incidence of Stone in Egypt: Series of 312 Operations. F. C. Madden.
19 *Four Cases of Black (Pigmented) Appendix. W. H. Battle
20 Procidentia of Uterus and Rectum at Age of 27 years. D. Drew.
21 Surgical Tuberculosis in Children, with Method of Treatment. A. H. Tubby.
22 *Analysis of Thirty-Five Consecutive Cases of Bradycardia. C. E. Lea.

19. **Black (Pigmented) Appendix.**—Microscopic examination showed the deposit of pigment in these cases cited by Battle to be in the mucous membrane, both in and between the cells. Chemical analysis showed that the pigmentation was produced by a deposit of iron, the exact combination not being defined owing to the small quantity of material available. The pigmentation was deep and most extensive in all, evidently going for an indefinite distance into the bowel. Its deposit to such an extent suggests that it was due to absorption from the contents of the large intestine, in a manner similar to that of the deposit of lead in the lead worker. There is, no doubt, a good deal of iron in the contents of the large bowel, but here there must have been more than usual and that for a long period. Had such a condition been likely to occur from the use of iron given in the form of medicine, the post-mortem records must have described it long ago. These cases are the only ones in which Battle has found such a curious condition (for it has no clinical significance) in a long series of operation cases. He thinks that it may be due to excess of iron in the flour which is put out from the roller-mills, the influence of which on appendicular constipation, the formation of some concretions, and when in a coarse form the direct production of appendicitis, is difficult to estimate.

22. **Analysis of Thirty-Five Cases of Bradycardia.**—The period of Lea's observations was two years. In all cases polygraphic records were gained. Relative incidence: true bradycardia, seven cases; missed beat, nine cases; auricular fibrillation, sixteen cases; heart block: auricle active, three cases. Lea concludes that in most cases the cause of bradycardia (excluding Class 1) may be attributable to altered *a. v.* conductivity, that such a cause is responsible not only for Classes 3 and 4, but also possibly for Class 2; and that in most cases of auricular fibrillation, but not all, the cause is digitalis

Bulletin de l'Académie de Médecine, Paris

July 1, LXX, No. 25, pp. 1-19

23 Transient Familial Paralysis of the Legs; Six Cases in Two Families. E. Lenoble and C. Achard.
24 Migraine of Ethmoidal Origin. G. Guisez and Balzer.

Journal de Médecine de Bordeaux

July 13, LXXXIV, No. 28, pp. 445-460

25 Necessity for Educating the Public in Hygiene. L. Barthe.
26 The Alkaloids of Kola. (Sous quelle forme les alcaloïdes de la kola existent-ils dans les fruits?) P. Carles.

Lyon Médical, Lyons

June 29, XLV, No. 26, pp. 1389-1444

27 *Nervous Throat Disturbances. (Psychopathies pharyngo-laryngées.) Collet.
28 *Nervous Manifestations in Syphilis after Salvarsan. (Des accidents, dits "neurorécidives" consécutifs aux injections d'arséno-benzol.) Carle.
29 The Latent and the Active Phases of High Blood-Pressure. (Les deux phases de l'hypertension artérielle.) L. Gallavardin.

July 6, No. 27, pp. 1-48

30 Local Hemorrhage Causing Hemolytic Jaundice. (Rapport des pigmentogenèses locales et des ictères hémolytiques.) E. Leuret and H. Gauvenet.
31 Vertigo with Glaucoma. L. Dor.

27. **Nervous Affections of the Throat.**—Collet describes a case of nervous aphonia in a choreic boy of 11; one of difficult deglutition in a neurasthenic woman of 50; a nervous cough in a boy of 17 who afterward developed melancholia; paralysis of the palate in a neuropathic elderly woman, and a case of extreme dyspnea in a physician of 50 who passed into a condition of manic-depressive insanity. Collet emphasizes the necessity of extremely careful examination in such cases to exclude organic disease.

28. **Nervous Manifestations after Salvarsan.**—Carle comments on the number of cases of "neurorecurrences" which have been published following the intravenous administration of salvarsan. He reports from his own experience a case of fatal hemiplegia, and discusses the various theories as to the cause of such accidents after salvarsan. His conclusion is that they are due to the breaking out of latent syphilitic foci in the nervous system as the result of the lowered resistance produced by the drug. He believes that where the symptoms point to involvement of the nervous system, such as severe and continuous headache, insomnia, agitation, inability to work, asthenia and vertigo, the medicinal treatment should be confined to mercury; if salvarsan is used it should be given only intramuscularly and with the greatest caution. His previous discussions of the subject were in the May and October, 1912, issues of the *Lyon Médical*.

Presse Médicale, Paris

July 9, XXI, No. 56, pp. 565-572

32 Enhanced Resistance of the Blood-Corpuscles. (De l'hyperresistance globulaire au cours de certains états lytiques des sérums.) E. Weill and A. Dufourt.
33 Reflex Contraction of the Large Intestine from Impulses Emanating from the Stomach. H. Lebon and P. Aubourg.

July 12, No. 57, pp. 573-584

34 External Secretion and Internal Secretion. (L'élaboration cellulaire et la sécrétion.) A. Petit.
35 Efficacy of Electric Treatment of Rhinophyma—Hypertrophic Acne. H. Bordier.

Revue de Chirurgie, Paris

June, XXXIII, No. 6, pp. 785-934

36 *Nerve Tissue Tumors Simulating Spina Bifida. (Les faux spina bifida.—Médullomes ou médullo-embryomes.) E. Estor and E. Etienne.
37 *Sarcomas of Tendon Sheaths. (Les sarcomes des gaines tendineuses.) J. P. Tourneux.
38 *Formation of Vagina. (Création d'un vagin en cas d'absence congénitale de ce conduit par greffe d'une anse intestinale.) E. Quénu and A. Schwartz.

36. **False Spina Bifida.**—Estor and Etienne recently removed a congenital tumor from the back of the neck which they supposed to be a spina bifida, but a central plug of nerve tissue was found in the tumor, as also in a similar tumor removed by Vialleton. Both tumors were easily excised with-

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out serious effects. They were evidently of embryonal origin, either a malformation or a rudimentary second embryo. Differentiation of this class of tumors from spina bifida is important as they can be removed with ease. The fact that they have a pedicle differentiates them from dermoid cysts, angiomas, etc., and the absence of nervous disturbances and of tenderness excludes spina bifida. The only danger in operating is from the communication with the meninges, thus possibly opening up the meningeal cavity during the operation which might entail serious losses of cerebrospinal fluid. It is necessary therefore to ligate the pedicle with extreme care, and keep close watch over the patient afterward until healing is complete. The operation in one of the cases reported was done at the age of 40; the diameter of the tumor was about the length of the boy's ear in one case; in the other the tumor projected like half a banana.

37. **Sarcoma of Tendon Sheaths.**—Tourneux has found quite an extensive literature on this subject with records of ninety-three cases, all but thirty-eight in males. The youngest patient was 5, the oldest 83, but the majority were between 18 and 40. In sixty-six cases the lesion was in the forearm in six, in the hand in twelve and on the fingers in forty-eight. In twenty-six cases the sarcoma was on the foot in nineteen and on the toes in seven, while a tendon sheath in the leg was involved in only one instance. The sheaths involved belonged to flexor tendons in all but sixteen cases. There was a history of trauma in fifteen of the ninety-three cases. The predilection of the sarcoma for the plantar and palmar regions suggests that repeated slight trauma must be a contributing factor. The symptoms are long exclusively local; tumefaction is constant but there may or may not be pain. The prognosis is grave as the list of recurrences is a long one and many of the patients were lost sight of. The ultimate outcome is more promising the earlier the growth is cut out, and especially when the microscope reveals marked predominance of multinuclear elements—myeloplaxes. If the growth has spread so that even with a long operation there is little hope of removing all the tissues showing change, disarticulation or secondary amputation should be the rule. There was prompt recurrence and generalization in eight of the fourteen cases of round-celled sarcoma and in six of sixteen cases of the spindle-celled variety. Boeckel did four operations for recurrence on one patient. Discovery of the round-celled variety thus calls for secondary amputation without delay. To wait for metastasis is fatal.

38. **Formation of Artificial Vagina.**—Quénu and Schwartz compare the different technics that have been applied and state that the results seem to have been excellent in the fifteen cases on record, whatever method had been employed. A personal case is reported in detail.

Revue Mens. de Gynécologie, d'Obstétrique et de Pédiatrie, Paris

June, VIII, No. 6, pp. 373-424

39 *Mental Disease of Genital Origin. (Psychopathies d'origine génitale.) R. Schockaert.

39. **Psychopathies of Gynecologic Origin.**—Schockaert here reports four cases in addition to three he has previously published, in all of which correction of retroflexion of the uterus or other anomaly was followed by complete recovery from melancholia or other psychopathy from which the patient had long suffered. There was no endometritis and the adnexa seemed sound. The mental trouble can be explained by assuming that the displacement of the uterus started some abnormal irritation or stimuli which acted on the central nervous system by the intermediation of the sympathetic system, upsetting its functional balance. Convulsions may be brought on in children in the same way by a fright or anger or by an acute pain. Not merely the genital organs in women but any organic anomaly in man or woman may upset the psychic balance in the predisposed; and, on the other hand, correction of the organic anomaly may restore the psychic balance to normal. The psychopathies connected with the female genital organs were always in his experience of the type of severe melancholia, ideas of suicide and persecution or acute mania. He reiterates in conclusion that gynecologic affections often insignificant in appearance may in some cases be responsible for distressing psychopathies which in turn may be cured by removing this cause.

Semaine Médicale, Paris

July 9, XXXIII, No. 28, pp. 325-336

40 Firearm Abdominal Wounds. (Le traitement des plaies par armes à feu de l'abdomen en pratique de guerre et en pratique de paix.) F. Lejars.

July 16, No. 29, pp. 337-348

41 *Frequency of Development of Fistula during Application of Artificial Pneumothorax. L. Bard.

41. **Laceration of Lung Tissue in Course of Artificial Pneumothorax.**—Bard presents evidence to prove that pleuro-pulmonary fistulas are of much more frequent occurrence in the course of injection of a gas to induce an artificial pneumothorax than has generally been recognized. But his evidence further goes to show that this complication is not dangerous enough to be regarded as contra-indicating the measure in the cases inevitably doomed without it. The fistula at first is rather an aid than the reverse, as it assists in the compression and collapse of the lung; but its ultimate results, when it persists, are far from negligible, so that it is a complication which it is better to avoid. A personal case is described to show the symptoms liable when a fistula is formed in this way. They are generally ascribed to a serous effusion and differentiation is possible usually only by measuring the pressure. The presence of a valve fistula is rendered probable by the persistence of the pressure at the same level during both phases of tranquil breathing. As long as there is an air bubble above, the fistula is probably still permeable. Every effort should be made to heal up the fistula, and the best means for this is to keep the pressure in the pleural sac above that in the lung. Pressure from a fluid in the pleural sac is not tolerated as well as pressure from a gas.

Beiträge zur Klinik der Tuberkulose, Würzburg

XXVII, No. 2, pp. 103-290. Last indexed August 2, p 372

42 Rosenbach's Tuberculin. K. Lesser and H. Kögel.
43 *Tuberculosis of the Thyroid. (Tuberculose der Schilddrüse.) S. Pollag.
44 Pathology and Drug Treatment of Fever in Pulmonary Tuberculosis. M. Damask.
45 Earning Capacity with Slight Pulmonary Tuberculosis. (Die Arbeitsfähigkeit der Leicht-Lungenkranken.) A. Mayer.
46 Artificial Pneumothorax at Fourth Month of Pregnancy. D. O. Kuthy and G. Lobmayer.

43. **Tuberculosis of the Thyroid.**—Pollag devotes thirty-six pages to a summary of the literature on tuberculous affections of the thyroid and to a detailed account of three cases he has personally encountered. The opinion used to prevail that a goiter protected against tuberculosis, and it is certainly a fact that the thyroid is only rarely invaded, even granting that many tuberculous thyroid affections may escape detection. It seems evident that the thyroid has greater power to resist tuberculosis than other organs, and it is possible that its iodin content may be responsible for this. The tuberculous thyroid process in itself is never fatal but it is liable to become associated with miliary tuberculosis, meningitis or myxedema. When a sound thyroid is attacked, the process spreads more rapidly than when a tough, fibrous goiter is involved. Pollag regards the tuberculous involvement of the thyroid as on a par with malignant syphilis, as it indicates that the resisting powers of the organism are at a very low ebb, the Wassermann test giving a negative response as the organism is unable to produce antigens in sufficient amounts.

The treatment of thyroid tuberculosis should be on the principle of removal of the focus while sparing the sound tissue as much as possible. If symptoms follow from loss of thyroid functioning, thyroid treatment or transplantation should be considered. It seems to be now established that the toxins in cachexia thyreopriva are produced in the spleen; if this is true, the logical consequence would be the theory that splenectomy would remove the source of the toxins.

This might be considered in case of very serious phenomena from loss of thyroid functioning. Hamburger and Costa have recommended sending tuberculous patients to regions where goiter is endemic, hoping by inducing an exaggeration of thyroid functioning to exert a favorable influence on the tuberculosis elsewhere. Morin ascribes much of his success in immunization of animals against tuberculosis to feeding the animals with thyroid tissue. Biolakur and others urge the necessity for an operation on the thyroid when symptoms of exophthalmic goiter are observed in the course of pulmonary tuberculosis; improvement of both the thyroid affection and of the tuberculous process elsewhere has been known to follow an operation on the thyroid. Frugoni and Grixoni found that their tuberculous patients got along much better when they were given systematic thyroid treatment. They have also reported a case in which exophthalmic goiter retrogressed as the thyroid developed sclerosis. In one of Pollag's three cases the tuberculous abscess in the thyroid was treated with a palliative operation, as the patient was an elderly woman with a bad heart. The thyroid shriveled up afterward, amounting to a clinical cure. He suggests that it might be possible to hasten this obliterating process by injection of phenol or other caustic, or injection of bismuth paste, after the preliminary evacuation and curetting of the focus.

Berliner klinische Wochenschrift

July 7, L. No. 27, pp. 1241-1284

47 *Serodiagnosis of Pregnancy. J. Veit. (Die Serumfermentreaktion nach Abderhalden.) B. Aschner.
48 *Miliary Tuberculosis following Friedmann's Treatment. (Bericht über einen nach Friedmann behandelten Fall von Tuberkulose.) M. Westenhöfer.
49 Radium Emanations in Gout. P. G. Meserritzki.
50 Leukocyte Inclusions. (Die Döhle'schen Leukocyteneinschlüsse.) A. Brinchmann.
51 *Dietetics in Cardiovascular Disease. (Diätetik der Herz- und Gefässkrankheiten.) H. Vaquez. Commenced in No. 26.
52 *The Movements and Attitudes in Spastic Paralysis Recall those of Climbing Animals. (Das phylogenetische Moment in der spastischen Lähmung.) O. Foerster. Commenced in No. 26.

47. **Serodiagnosis of Pregnancy.**—Veit has had the Abderhalden technics for serodiagnosis of pregnancy given thorough tests at his clinic, controlling the dialysis method by the optic technic, and his conclusions are strongly in favor of the specific nature and the reliability of the method. The findings seem to be the tangible manifestation of the presence of a placenta; the findings are positive even in non-gravid animals prepared by injections of placenta tissue. Aschner reviews further the experiences with 250 women to whom the test was applied by one or both technics. Extra-uterine and pathologic pregnancies respond positively when there is a living placenta, while the serum of non-pregnant women invariably fails to respond. In a few instances of uterine cancer and disturbance in ovarian functioning a very feeble reaction was exceptionally observed, but it never stood the control test.

48. **Miliary Tuberculosis Following Friedmann's Treatment.**—Westenhöfer relates that an American physician of means, Dr. McC., aged 32, came to Berlin with his medical attendant and Friedmann gave him an injection of his remedy. McC. was of a frail physical constitution, with general hypoplasia of the vascular system, and had pulmonary tuberculosis but he was in comparatively good condition when he arrived in Berlin, according to the testimony of his accompanying medical attendant. He was increasing in weight and was free from fever. Friedmann assured him that he would recover his health entirely, and allowed him to smoke and take evening walks although it was winter. He was picked up on the street, February 14, with fatal hemoptysis, and necropsy revealed diffuse miliary tuberculosis of not more than two weeks' standing. Westenhöfer calls attention to the fact that the site of the Friedmann injection was the seat of a pronounced miliary process. According to Friedmann's claims, this point at least should have been a region of greatest resistance. The old processes in the lungs were not of decidedly progressive nature. It is possible, Westenhöfer suggests, that the relief afforded by Friedmann's assurance that the patient would certainly completely recover may have been responsible for a more irregular mode of life than that to which he had been accustomed. Westenhöfer concludes with the remark that it is impossible to deny that the Friedmann inoculation may have induced a typical tuberculosis at the point of the injection, but it is likewise impossible to prove this. (This case and the discussion on it were summarized in the Berlin Letter, THE JOURNAL, July 5, 1913, p. 50.)

51. **Dietetic Management of Cardiovascular Disease.**—Vaquez concludes his long article with the general statements that arteriosclerosis and abnormally high blood-pressure do not require any special dietetic regulations either in treatment or prophylaxis, beyond care that the ordinary food is digested, assimilated and the waste thrown off in proper manner. With failing compensation of a valvular defect, the physician must be on the alert to detect retention in any guise. Here become necessary besides drugs to act on the heart, great moderation in the intake of fluids and reduction of the proportion of salt in the food, to ward off edema. The intake of salt must be restricted over varying periods according to the individual case, and the diet restricted to milk and vegetables, with complete repose; these measures will aid in keeping the systole normal and postpone asystolia. If compensation has been restored, the patient can be allowed to resume his usual mode of life, merely dropping from the diet articles known to be harmful to him. When the insufficiency of the heart is accompanied by advanced lesions of the kidneys, the restrictions must be more severe and be kept up longer. On a salt-free diet the attacks of cardiac asthma and of pulmonary edema become less and less frequent. The benefit was so marked in some of his cases that the patients held spontaneously to the salt-free diet for months or years or returned to it spontaneously at the first sign of impending trouble. When the kidneys are sound, meat can be eaten with the salt-free diet, but with renal lesions meat must be dropped more or less completely, as retention of urea frequently accompanies retention of salt and water. It is a more difficult matter, he adds, to combat retention of urea as it is almost impossible to exclude albumin completely from the diet without danger of inanition. Even milk contains so much albumin that attacks from retention of nitrogenous substances in the blood may be brought on even by two liters of milk a day. It is better to give less milk and combine it with fruit and vegetables; the nourishing value is low, but by varying the combinations and dishes it is possible to keep up the patient's appetite on this diet over long periods. In short, he concludes, study of the elimination of the various articles of diet must be the guide for the dietetic restrictions. It is worse than folly to forbid certain articles arbitrarily when this particular patient is able to utilize these special articles perfectly. Only those articles should be more or less completely dropped from the diet which experience and laboratory tests show the individual in question is unable to eliminate. Alcohol in all forms should be forbidden; this, he remarks, belongs more to toxicology than to dietetics.

52. **The Contracture in Spastic Paralysis.**—Foerster gives twenty-one illustrations to sustain his assertion that the contractions in spastic paralysis resemble in all points the climbing movements and grip of monkeys. The movements and contractures with spastic paralysis are a phylogenetic reminiscence of the climbing act. There is, he says, evidently a functional awakening of the subcortical centers innervating the muscles involved in the contracture, after the pyramidal tracts cease functioning.

Correspondenz-Blatt für Schweizer Aerzte, Basel

June 28, XLIII, No. 26, pp. 801-832

53 Deafmutism. (Ergebnisse der Taubstummenuntersuchungen in der Taubstummenanstalt. St. Gallen.) E. Gallusser.
54 Small-Pox. (Epidemiologisches und Experimentelles über Variola und Vakzine.) M. Tièche. Commenced in No. 24.

July 5, No. 27, pp. 833-864

55 Carbon Dioxid Snow in Therapeutics. (Ueber die Therapie mit fester Kohlensäure.) E. Sommer.

Deutsche medizinische Wochenschrift, Berlin

July 3, XXXIX, No. 27, pp. 1289-1344

56 *Purgatives and Antidiarrheics for Children. (Der Gebrauch von Abfuhrmittiel und Stopfmitteln im Kindesalter.) W. Birk.
57 *Pathogenesis of Pernicious Anemia. C. A. Ewald and E. Friedberger.
58 Motor Functioning of the Intestines. (Ueber Darmbewegung und Darmform.) G. v. Bergmann and G. Katsch.
59 Astigmatism and Myopia in the Orient. (Ergebnisse vergleichender Refraktionsuntersuchungen an höheren Schulen der Levante und Ostindiens.) F. F. Kruslus.
60 *Benzol in Leukemia. (Fall von benzolbehandelter Leukämie mit eigentümlichen Verlauf.) K. Jespersen.
61 Abscess in Thyroid with Pure Cultures of Typhoid Bacilli, Twenty-One Years after Typhoid and Followed by Acute Exophthalmic Goiter. (Strumitis posttyphosa apostematosa tarda und sekundäre Basedowsche Krankheit.) G. Gali.
62 Atony of the Cecum. (Zur Diagnose der Blinddarmerschlaffung.) H. Stern.
63 Action of Gymnastics on the Circulation. (Wirkung der Heilgymnastik auf die Blutzirkulation im Lichte der Hydrodynamik.) S. Salaghi.
64 Technic for Diathermia in Joint Disease. A. E. Stein.
65 Quinin Salve in Prophylaxis of Syphilis. J. Schereschewsky.
66 *Mistake in Sex. (Erreur de sexe.) E. Zurhelle.

56. **Constipation and Diarrhea in Children.**—Birk emphasizes anew that the feeding of children with much milk, eggs, butter and meat, but scarcely any cereals, is almost certain to make them constipated on account of the lack of waste. Laxatives afford but temporary relief and leave the condition worse than before. By correcting the diet, giving vegetables, potatoes and bread, constipation will right itself. He adds that it is not enough to add these articles of food to the diet; they must be taken instead of milk and eggs, which must be dropped almost completely. He says that potato is better given in the form of salad than mashed. The sluggish intestines do not respond at once to the change in the diet, but with a little patience all is soon well. He decries particularly the use of purgatives and laxatives for infants, regarding the food in all cases, young and old, as the true source of the trouble, readily curable by correcting the diet. For infants with diarrhea, he stops all food for twenty-four hours, giving merely tea, sweetened with saccharin instead of sugar to prevent further abnormal fermentation in the bowels. The intestines are generally empty by the end of twenty-four hours and the fermentation ceases for lack of fuel. The two following days he gives only thin oatmeal gruel and then gradually returns to milk. Under this treatment the milder cases promptly recover, but in the severer type the fermentations commence again as soon as the former food is resumed. The children in this class usually have a history of several attacks of diarrhea, or the incorrect food has been continued notwithstanding the rebellion of the intestines. For these severe types, restriction to albumin or protein milk answers ideally the desired purpose. Thanks to its minimal sugar content, the fermentation processes get no sugar for further fuel, and thanks to its high albumin content it promotes putrefaction processes to such an extent that formed stools result such as otherwise are encountered only in constipated infants. The albumin milk or its equivalent is thus a true causal therapy, and experience has confirmed the theoretical premises so that it must be regarded as the ideal antidiarrheic for infants. Constipation from malnutrition owing to unsatisfactory utilization of milk is to be combatted with malted gruel; laxatives or purgatives are absolutely contra-indicated in constipation from this cause. With malnutrition from milk, the stools abound in lime soaps and the system is thus being abnormally drained of its lime. It is by no means a casual coincidence that children with "milk malnutrition" (*Milchnährschaden*) are exceptionally prone to rachitis and convulsions. He declares that when there is already an abnormal draining away of lime, to add to the drain by giving purgatives and neglecting the correction of the diet, is little better than malpractice. The most striking symptom of milk malnutrition and its consequences is the peculiar gray, dry stools, the so-called soap stools. The infant's power of tolerating cow's milk is exceptionally low in these cases, and any amount over this limit acts almost as a direct poison. The proportion of milk in the diet must be reduced and the deficit in calories made up by carbohydrates, and it is important to give the carbohydrates in the form of maltose, a malted gruel. His directions for making the gruel are to beat in 50 gm. of wheat flour in a third of a liter of milk and strain. In a second vessel 100 gm. of (Löfflund's) malt soup extract is dissolved in two-thirds of a liter of water at 50 C. and heated nearly to boiling. Then the flour-milk mixture is added and the whole heated for three or five minutes.

[Ruhräh's directions for a malted gruel are to boil a tablespoonful of any flour desired in a little more than a pint of water for fifteen minutes. As soon as it has cooled, a teaspoonful of a good malt extract or a teaspoonful of diastase is added. The mixture is stirred thoroughly, and may then be used in the place of ordinary barley water. Diastase preparations are made by most of the leading manufacturing chemists. Chapin suggests that a home-made decoction of malt be used in making malted gruel. His directions are as follows: A tablespoonful of malted barley-grains is put in a cup and enough cold water added to cover it—usually two tablespoonfuls. This is prepared in the evening and placed in the refrigerator over night. In the morning the water, looking like thin tea, is removed with a spoon or skimmed off and is ready for use. About a tablespoonful of this solution can be secured and is very active in diastase. It is sufficient, he says, to dextrinize a pint of gruel in ten to fifteen minutes. This should be prepared fresh every day.]

Birk states that the effect of the malted gruel is apparent almost at once. The stools become dark brown and there are three or four passages a day. His article on "Purges and Antidiarrheics" is thus practically equivalent to "Don't use them." Regulation of the diet is the main and the indispensable factor in treatment and renders drugs unnecessary.

57. **Pathogenesis of Pernicious Anemia.**—Ewald was unable to detect any hemolytic action in an emulsion of the tissues of the intestinal walls in two recent cases of fatal pernicious anemia. His research thus failed to confirm Berger's statements in regard to the presence of a lipoid hemolytic substance in the intestinal walls as the cause of pernicious anemia.

60. **Benzol in Myeloid Leukemia.**—The improvement under the benzol was marked in the case reported, but this patient, too, soon died after a period of uncontrollable nosebleed and vomiting.

66. **Mistaken Sex.**—Zurhelle reports another case of *erreur de sexe*, and expatiates on the folly and harm of bringing up as a girl a person with deformed male genital organs. The hardships thus wrought, the possibility of police complications, and the danger of drifting into suicide are abundantly illustrated in the case reported. The patient had penile-scrotal hypospadia but had been brought up as a female, had been twice married, each time to elderly widowers, and had been a "widow" for five years.

Medizinische Klinik, Berlin

July 6, IX, No. 27, pp. 1065-1104

67 Significance of the Spirochete Findings in Progressive Paralysis. (Ueber die Tragweite der Spirochätenbefunde bei progressiver Paralyse.) A. Hoche.
68 *Conservative Treatment of Streptococcus Abortion and its Results. M. Traugott.
69 *Salvarsan Intoxication and Hypersusceptibility to Arsenic. K. Brandenburg.
70 Dietary in Sanatoriums and Hospitals. (Die rationelle Einrichtung der Diätküche in Krankenhäusern und Sanatorien.) A. Schmidt.
71 The Gall-Bladder and the Chemistry of the Stomach. (Gallenblase und Magenchemismus.) G. Magnus.
72 Swelling of the Preauricular Lymph-Nodes as Sign of Stye. (Ein klinisch wenig beachtetes Symptom beim Hordeolum externum.) M. Bondi.
73 Comparative Influence of Water, Carbonated and Mud Baths on the Temperature. R. Schmincke.
74 The Wassermann Reaction in Blister Serum. (Experimentelle Beobachtungen über die Wassermannsche Reaktion im Inhalte von Cantharidenblasen.) A. Buschke and E. Zimmermann.
75 Serodiagnosis of Pregnancy. (Beiträge zu Abderhaldens Serodiagnostik.) Evler. Commenced in No. 26.

68. **Conservative Treatment of Streptococcus Abortion.**—Traugott commends the method of treating abortion which has proved its usefulness in hundreds of cases at the Frankfurt clinic for women. It is based on the discovery that certain germs in the uterus, colon bacilli, non-liquefying staphylococci,

etc., proliferate only in the retained clots and membranes in the uterus but have no power to penetrate into sound tissue. Consequently if bacteriologic examination shows that only one or more of these species are at work in the uterus, it is a simple and harmless matter to empty the uterus with the fingers, insert a strip of gauze deep in the uterus and tampon the vagina, giving possibly a little ergot. The physician can then wait patiently for the woman to get well, confident that his course has been absolutely correct. In the 246 cases of febrile or non-febrile abortion in which treatment on these principles was applied, the trouble remained limited to the uterus and a smooth recovery followed. But if bacteriologic examination reveals streptococci, liquefying staphylococci, or gonococci, then the treatment must be entirely different. The slightest local intervention is liable to promote the spread of the infection in the uterus; all that can be done in this case is to keep the woman absolutely still in bed, with nourishing food prepared with special care to render it appetizing, with abundance of water given by the mouth and by subcutaneous or rectal infusion. Wine or brandy are also given, but no drugs, and unless there are further chills and the number of the cocci in the blood increase or there is dangerous hemorrhage, he waits patiently for the patient to improve and the clots, etc., in the uterus to be spontaneously expelled—always under repeated bacteriologic control of the lochia. When the leukocyte count approximates normal and the patient is free from fever and feels better generally, the treatment as for the other group of cases is applied, namely, digital evacuation of the uterus when it can be done easily, followed by tamponing. The uterus clears itself of the streptococci in time provided the streptococci have not been implanted by our manipulations in hitherto free tissues and a new battle-ground thus started. All of the 138 women with streptococci or liquefying staphylococci in the lochia treated on these principles recovered, while 18.1 per cent. died, of ninety-nine women under the same conditions, but treated by the old principle of immediate evacuation of the uterus, and only 67.7 per cent. made a smooth recovery while this occurred in 94.9 per cent. of the 138 conservatively treated.

69. **Toxic Action of Salvarsan.**—Brandenburg reports the case of a robust man of 38 who had had no symptoms of syphilis after thorough treatment ending four years before; his wife and children were healthy, and the Wassermann test was negative. But on general principles he thought he had better have a prophylactic injection of salvarsan, and an intravenous injection of 0.5 gm. was given him by a skilled and experienced Berlin specialist. Nausea, vomiting and diarrhea followed the injection at once and the patient died the fourth day in convulsions. In a second case an intravenous injection of 0.1 and 0.2 gm. in the course of a few days was followed by paralysis of both arms. The patient was an anemic man of 33. The reaction of degeneration was pronounced, but conditions gradually improved in the course of six months although the arms are still weak. There was no suspicion of syphilis in this case and the salvarsan was given merely as a means of administering arsenic in convenient form to influence the pallor, physical depression and tendency to dizziness which had persisted after an operation for chronic appendicitis. No cause for the anemia was discovered.

Monatsschrift für Kinderheilkunde, Berlin

XII, No. 3, pp. 161-150

76 Alimentary Albuminuria in Children. (Uebergang von Eiweisskörpern aus der Nahrung in den Harn bei Albuminurie der Kindern.) A. Hayashi.
77 Treatment of Rectal Prolapse in Children. F. Pielsticker.
78 Typhoid in a Child Complicated by Stenosis of the Larynx. (Seltene Komplikation des Kindertyphus.) S. Samelson.
79 *Diet in Scarlet Fever. R. Gerstley.
80 *Atropin in Treatment of the Exudative Diathesis. (Exsudative Diathese und Vagotonie.) N. Krasnogorski.
81 Pulmonary Tuberculosis in Infants. A v. Konschegg and R. Lederer.

79. **Diet in Scarlet Fever.**—Gerstley reports 306 cases of scarlet fever among which forty cases of nephritis appeared. Half of the patients were restricted to a milk diet while the other half were given full diet. He concludes that the full diet is preferable, for the meat in the diet did not show any bad effects in the cases of nephritis or tend to bring on nephritis, while it had a favorable influence on the blood picture, increasing the number of red blood-cells decidedly. Many children when they begin to be active during convalescence from scarlet fever show a falling off in the blood-count. The majority of these cases respond with a positive reaction to the Pirquet test.

80. **Atropin in the Treatment of the Exudative Diathesis.**—Krasnogorski recalls that if the chromaffin system (the epinephrin-producing apparatus) is hypoplastic, the sympathetic nervous system lacks the stimulus from the epinephrin, as is also the case when there is hyperplasia of the lymphoid organs (the antagonist apparatus). The result is a condition of atony of the vagus nervous system, called, "vagotony" by Eppinger and Hess. The symptoms of this vagotony seem to be the same as those of the exudative diathesis described by Czerny. Krasnogorski consequently gave atropin to act on the vagus nervous system to six children with the exudative diathesis and reports most excellent results. It inhibits the exudation and the effects were most brilliant in the cases of moist eczema. It was also beneficial in chronic bronchitis and bronchopneumonia in children exhibiting symptoms of the exudative diathesis. Very large doses of the atropin can be given in these cases. He gave infants of 4 or 5 months a solution of atropin sulphate corresponding to the maximum dose for adults, namely, 0.0025 gm. atropin sulphate per day. No dilatation of the pupils was observed and no acceleration of the heart action.

Münchener medizinische Wochenschrift

July 8, LX, No. 27, pp. 1473-1528

82 The Energometer. (Experimentelle und klinische Untersuchungen über Kreislaufdiagnostik mit dem Energometer.) F. Hapke.
83 Cutaneous Diphtheria. (Ueber Hautdiphtherie mit ungewöhnlich starker Antitoxinbildung.) H. Kleinschmidt.
84 *Pyelitis and Pregnancy. (Die Beziehungen der Koli-Pyelitis zur Fortpflanzungstätigkeit.) A. Mayer.
85 Thermoprecipitin Reaction in Tuberculosis. A. Fagiuoli.
86 *Influence of Alkalies on Spasmophilic Conditions. F. Lust.
87 Mouse Cancer. E. Erhardt.
88 Extraction of Foreign Bodies in Children's Lung. (Lungenfremdkörper beim Kinde.) E. Sehrt.
89 Tuberculosis and Syphilis in German Southwest Africa. E. Scherer.
90 *Treatment of Pyelitis by Direct Sterilization of the Kidney Pelvis. (Weitere Erfahrungen über die Behandlung der Pyelitis mit Nierenbeckenspülungen.) H. Hohlweg. Commenced in No. 26.

84. **Relations between Colon Bacillus Pyelitis and the Genital Apparatus.**—Mayer ascribes considerable etiologic importance to appendicitis and tonsillitis in the development of pyelitis; a pregnancy merely induces a predisposition. In two cases in his experience infection of the genital apparatus was evidently due to ascending infection for which the pyelitis was responsible. In two other cases profuse hematuria for which the pyelitis was responsible simulated uterine hemorrhage; it came on in one case like the hemorrhage of placenta praevia. He states that pressure on the inflamed right ureter will often induce pain in the ileocecal region similar to that of appendicitis. It is peculiarly liable to be confused with the latter as there may be no change in the urine for a time or the changes may be slight and transient or the ureter may be blocked so that only the urine from the sound kidney is obtainable at the time. A dull pain is sometimes elicited in the diseased ureter by straining as at stool or by contracting the muscles as in striving to prevent defecation. Pyelitis may also induce symptoms suggesting peritonitis; in one such case a laparotomy was done on the assumption of ileus from compression of the intestine by the gravid uterus. The pyelitis may also simulate puerperal infection or it may be accompanied by pain during respiration as the diseased kidney is moved in breathing, and pneumonia may be erroneously diagnosed. In two cases in his experience the pyelitis was actually accompanied by involvement of the pleura, the infection prob-

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ably spreading through the lymphatics to the peritoneal and pleural side of the diaphragm. The lungs may be secondarily affected or may suffer from mechanical conditions. In one case the signs and symptoms suggested pneumonia, puerperal fever, appendicitis and pyelitis, all at once, but the diagnosis finally narrowed down to the latter alone.

86. **Spasm-Producing Action of Potassium.**—Lust writes from the university clinic at Heidelberg in charge of Moro to relate a case of tetany following on a severe gastro-intestinal disturbance in a child of 2. The remarkable feature of the case was that the tetany came on regularly when there was marked retention of water, and it subsided with this. He thinks it is evident that the tetany was due to substances retained in and with the water, and everything seems to point to the potassium salts in the water as the substances to be incriminated. He is inclined to believe that potassium and sodium salts have a direct spasm-producing influence while lime has the opposite effect, reducing the tendency to spasms. The sodium and still more the potassium salts display their spasmogenic influence sometimes in doses no higher than the proportions of these salts usually present in milk.

90. **Rinsing Out the Kidney Pelvis in Treatment of Pyelitis.**—Hohlweg declares that this method of treating pyelitis ensures in nearly every case not only a clinical but a bacteriologic cure and thus permanent recovery. The outcome is naturally better the earlier the treatment is begun. He always uses for the rinsing fluid a solution of silver nitrate, gradually increasing the strength from a 1 or 2 per thousand to a 0.5 or 1 per cent. solution. The toleration varies with the patients; some complain of pain with the weaker, others not even with the stronger solutions. He usually applies the measure two or three times a week and the cure is generally complete in two or three weeks. Fifteen of his seventeen patients were thus completely cured and reexamination of twelve after an interval of six weeks to two and a half years shows that the cure was permanent. In only two of the total cases was it found impossible to realize a bacteriologic cure, and it proved later that the primary focus was in another organ in these cases.

Therapeutische Monatshefte, Berlin

July, XXVII, No. 7, pp. 469-548

91 *Roentgenotherapy in Gynecology. A. Hamm.
92 Subcutaneous Digitalis Treatment. E. F. Zurhelle.
93 Hypophysis Treatment in Rachitis: 16 Cases. K. Weiss.
94 The Amins and the Intermediary Metabolism. (Proteinogene Amine.) M. Guggenheim.
95 *Necessity for Greater Care in Prescriptions in Regard to Doses. (Sorgfältigere Abfassung ärztlicher Verordnungen • von starkwirkenden Arzneimitteln.) W. Heubner.
96 *Reform in Advertising of Medicinal Preparations. (Zur Bekämpfung der falschen Deklaration der Arzneimittel und des Reklameunwesens.) W. Heubner.
97 *Is the Advertising of Medicinal Preparations Necessary? (Die Bedeutung der Inserate in der Medizinischen Fachpresse.) W. Heubner.

91. **Radiotherapy in Gynecology.**—Hamm remarks that not even the brilliant successes of surgery have rid the public of the universal dread of operations, and consequently the new era of intensive and filtered dosage of the Roentgen rays seems to open new fields, especially in gynecology, if the reports from the Freiburg clinic are confirmed by the experience of others, and if we can learn to manage the rays as understandingly and as securely as we now use the scalpel. It is asserted from Freiburg (Gauss) that with the new technic it is possible to cure every patient with a myoma in five weeks, regardless of the woman's age or the size of the myoma. Krönig affirms that sarcomas retrogress under the rays even quicker than myomas. The improvements in the technic consist mainly in the exclusive use of hard rays, filtered through a sheet of aluminum 3 mm. thick, the tube only 20 cm. distant, and the rays sent from as many different points as possible on the "cross-fire principle." There has been no ray burn since this technic has been applied. Gauss' experiments with plant seedlings have confirmed the far greater destructive action of the hard rays on the tissues. The only by-effects he has observed with the new technic are the occasional "*Roentgenkater*," headache and nausea, persisting for from one to four days after the exposure. Hamm rejects radiotherapy for all gynecologic affections except myomas and hemorrhagic uterine disease. And with these he advocates operative measures by preference if it is possible with enucleation to retain the genital function of the uterus, or if the myoma is pedunculated and projects from the cervix, or there is suspicion of gangrene or of a mucosa carcinoma or of sarcomatous degeneration of the myoma—suggested by its rapid growth, hemorrhages and the lack of prompt influence from the Roentgen rays; also if the myoma has entailed acute incarceration of the bladder. Hamm tabulates the outcome with radiotherapy as reported from five large clinics, the successes ranging from 63 to 76.3 per cent., but the Freiburg clinic reports twenty-one cases of hemorrhagic metropathy with 100 per cent. cures, and seventy-nine cases of myoma with 100 per cent. cures since the new technic has been applied. Kraurosis vulvae yielded in one of Hamm's cases to treatment with ovarian extract. The attempt to sterilize a woman by means of Roentgen exposures is dangerous, he thinks, although it has proved effectual on animals and has been proposed as a harmless method of interrupting the pregnancy in a tuberculous woman. Gauss makes such patients sign a certificate that in case the attempt fails they will apply to a physician for an instrumental abortion as otherwise they might sue him for damages in case a deformed child should be born.

95. **More Care in Prescribing.**—The German authorities have recently issued a warning to physicians that the directions for the use of a potent drug prescribed must be written on the prescription. It is found to be a frequent custom for a physician to prescribe, for instance, 25 c.c. of sodium salicylate or one tablet mercuric chlorid, and give the patient merely verbal instructions how to use them—the patient was directed verbally to separate the salicylate into twenty-five equal parts and take half of this dose at certain intervals; the tablet of the chlorid was ordered to be dissolved in a beer bottle of vinegar. The authorities in their warning emphasize the danger of trusting to the memory or the intelligence of patients to carry out such verbal instructions. No decree was issued as they believe that an informal warning will put an end to the dangerous custom.

96-97. **Reform in Advertising of Medicinal Preparations.**—A pharmacist has recently published an appeal to have an expert pharmacist appointed as a government official inspector of establishments where drugs are manufactured so that the preparation of medicinal articles will be under his direct control at all times. The editor of the *Monatshefte* does not think this is practical, and points to the work of the Council on Pharmacy and Chemistry of the American Medical Association to show what can be effectively accomplished by other and wiser means.

The editor also comments with amusement on the hue-and-cry raised in regard to the "fundamental importance" of the advertising of medicinal preparations in the medical press, apropos of the recent denunciation to the authorities of medical journals which carry advertisements of drugs the publishing of which "to the public" is against the law. The matter was laughed out of court (see page 71 of THE JOURNAL, July 5, 1913), but the protests seemed to indicate that without the advertisements in the medical press, the members of the profession would be left entirely ignorant of the progress of scientific pharmacy. On the other hand, here comes a protest in a Vienna medical weekly against the "Accepted List of Medicinal Preparations" published by the German Kongress für Innere Medizin, the protest stating that such a list and the "acceptance" of medicinal articles by any council or the like are a disgrace and humiliation for the members of the profession as indicating that physicians rely exclusively on the statements in the advertisements to guide them in the use of drugs in their practice.

The editorial comment is merely "Which is right?" (*Wer hat nun recht?*)

Virchows Archiv, Berlin

June, CCXII, No. 3, pp. 321-476

98 Involution forms of Gonococcus. (Ueber die Involutionsformen des Gonokokkus Neisser und ihre Rolle als intracelluläre Zellparasiten.) H. Herzog. Commenced in No. 2.
99 Concretions in the Thyroid. (Zur Kenntnis der Sphärolithe in der Schilddrüse.) E. J. Kraus.
100 Endothelial Sarcoma of the Skin. L. Martinotti.
101 Granuloma Simulating Lymphoma. (Ueber ein plasmazelluläres Granulom.) M. Kusunoki and Frank.
102 Heart Changes in Pertussis. M. Brick.
103 Anatomic Changes in Osteogenesis Imperfecta. C. Kardamatis.
104 Connection between Arteriosclerotic Contracted Kidney and Chronic Interstitial Nephritis. (Beziehungen der sogen. arteriosklerotischen Schrumpfniere zum Morbus Brightii.) R. Friedländer.
105 Changes in the Leukocytes in Rabbits under Influence of Staphylococcus Infection. (Ueber die Leukozytenveränderungen bei Kaninchen unter dem Einfluss verschieden virulenter Staphylokokkenkulturen.) W. J. Glintschikoff.
106 Experimental Myocarditis. L. Loeb.

Wiener klinische Wochenschrift, Vienna

July 3, XXVI, No. 27, pp. 1101-1148

107 *Syphilis of the Kidney. (Weitere Erfahrungen über luetische und postluetische Erkrankungen der Niere.) R. Bauer and P. Habetin.
108 Serodiagnosis. (Nachweis organabbauender Fermente im Serum mittels des Abderhaldenschen Dialysierverfahrens.) J. Bauer.
109 Growth-Inhibiting Influence of the Spleen on Rat Sarcoma. (Ueber den wachstumshemmenden Einfluss der Milz auf das Rattensarkom.) P. Biach and O. Weltmann.
110 Comparative Serodiagnosis. (Vergleichende Untersuchungen über die Meiostagmin-Reaktionsfähigkeit der Extrakte verschiedener Dotterarten mit menschlichen Karzinomseris.) G. Kelling.
111 Differentiation of Acid-Fast Bacteria. (Kaltblüter-Tuberkelbazillus.) H. Dostal and F. Ender.

July 10, No. 28, pp. 1149-1192

112 Abnormal Interval between Systole and Pulse. (Experimentelle Untersuchungen über die Pulsverspätung.) E. Hoke and J. Ribl.
113 Extraction of Bullet from Third Ventricle; Death from Hemorrhage. A. Exner and J. P. Karplus.
114 *Bile Peritonitis. R. Vogel.
115 The Langerhans Islands in the Pancreas. J. K. Else.
116 Alimentary Levulosuria with Chronic Nephritis. M. Franke.
117 *Antiphlogistic Action of Subcutaneous Injection of Epinephrin. (Entzündungswidrige Wirkung subkutaner Adrenalininjektionen.) H. Januschke.
118 From the Campaign in Manchuria. (Erinnerungen aus dem Russisch-japanischen Kriege.) P. Bergengruen.

107. **Syphilitic Disease of the Kidneys.**—Bauer and Habetin declare that syphilis is responsible in a certain proportion of cases of kidney disease, and that prompt antisyphilitic measures in time would cure the kidney trouble. It is still a question whether the kidneys suffer from the action of the spirochete toxins or whether the spirochetes locate directly in these organs. The clinical picture, however, is characteristic, as they show by nine cases reported in detail. As a rule, the course is comparatively benign and chronic, with pronounced albuminuria and polyuria but no changes in the circulatory apparatus and only slight signs of uremia. In three of their cases, however, the affection developed suddenly as a severe, acute, hemorrhagic nephritis with uremia. The early appearance of the symptoms of uremia is particularly characteristic of this early syphilitic nephritis in the secondary stage of syphilis. The course in the three cases of this type was different in each: In one the nephritis subsided abruptly in an incredibly short time without treatment; by the end of ten days all was apparently in order again. In the second case the kidney trouble subsided after a stormy phase into a subchronic stage. The third case was under observation for ten years: first there was an acute hemorrhagic nephritis in the secondary stage of syphilis; this then subsided and after six years a syphilitic liver trouble predominated in the clinical picture. The findings in the kidneys now are merely high albuminuria without cardiovascular symptoms or abnormally high blood-pressure, but with occasional exacerbations of the kidney trouble with uremic symptoms and dropsy. This type corresponds to what Dieulafoy called generalized syphilitic amyloidosis. In six of the total nine cases encountered the kidney trouble had developed insidiously without anything at first to indicate nephritis. The Wassermann test is always unusually pronounced in these cases. There does not seem to be much hope of successful treatment in the old chronic cases with an insidious development; the prospects are much better in the cases with an acute onset, both at the time and later. Vorpahl has reported a case in which acute nephritis and a gumma in the tonsil developed the thirteenth year after infection with syphilis and both were cured by specific treatment. It is dangerous, however, to go to the extreme of starting specific treatment in eve y case of nephritis in a syphilitic. Thiroloix has reported a case of chronic nephritis in an old syphilitic; severe hematuria followed the second mercurial inunction and the patient died notwithstanding the kidney was immediately decapsulated, which usually has a favorable effect on the ordinary congestive exacerbations in nephritis. The Wassermann reaction was positive in the urine in five out of the nine cases here reported, and was positive in all when applied to the globulin fraction of the urine.

114. **Bile Peritonitis.**—Vogel's analysis of the literature on this subject and his own experimental research have convinced him that there is alwa s some perforation of the biliary passages which is responsible for bile peritonitis. It cannot occur without perforation.

117. **Inflammation-Inhibiting Action of Epinephrin and the Salicylates.**—Januschke calls attention to recent research by Gaisböck and others, the results of which have confirmed the view that the benefit from certain drugs in treatment of acute articular rheumatism and other inflammatory processes is due to their elective inhibition of the peripheral nerve impulses from the focus of inflammation. The antiphlogistics act by interrupting the reflex arc from the inflammatory focus. Epinephrin acts in this respect the same as the antineuralgics. Subcutaneous injection of morphin, quinin, antipyrin, sodium salicylate, epinephrin, calcium chlorid or magnesium chlorid, all had the same effect in his experimental research, breaking into the reflex arc and thus preventing or attenuating the inflammatory secretion which otherwise follows instillation of mustard oil into the rabbit eye.

Zentralblatt für Chirurgie, Leipsic

July 12, XL, No. 28, pp. 1097-1136, with Supplement, pp. 1-112

119 Operation for Gastric Cancer Adherent to the Colon. (Die Magenkolonresektion, eine typische Operation bei bestimmten Formen von Magenkarzinom.) G. Perthes.
120 Plastic Operation on Fractured Skull. (Zur Schädelplastik bei Depressionsfrakturen.) A. Hoffmann.
121 Technic for Suprapubic Prostatectomy. Jenckel.
122 Paralysis of Phrenic Nerve after Local Anesthesia of Brachial Plexus. F. Brunner.
123 Transactions of Annual Meeting of German Surgical Association.

Zentralblatt für Gynäkologie, Leipsic

July 12, XXXVII, No. 28, pp. 1029-1060

124 *Massage of Pregnant Uterus. A. Sippel.
125 *Successful Ovarian Treatment of Old Acromegaly. (Schwangerschaft nach Akromegalie.) L. Kalledey.

124. **Danger of Massage of the Pregnant Uterus.**—Sippel was recently summoned as expert in a case in which abortion had followed repeated vigorous massage of the two-months pregnant uterus by a quack, "to stimulate the bowel functioning and improve the general health." Sippel stated that massage of the pregnant uterus was always wrong and might or might not bring on abortion. The lawyer presented for the defense a page in Hoffa's Manual of Massage in which it is stated that cautious massage may avert an impending abortion. Sippel's comment was that while Hoffa was an eminent orthopedist, evidently his judgment in gynecologic matters could not be accepted as dependable. Sippel calls attention to the case to warn others against Hoffa's statement.

125. **Success of Ovarian Treatment in Acromegaly.**—Kalledey reports a case in which the clinical picture of acromegaly gradually developed, commencing at the age of 22. He was consulted when the woman was 32, and he ascribed to defective ovarian functioning and excessive hypophysis functioning the symptoms observed, especially the oligomenorrhea, dysmenorrhea, amenorrhea and acromegaly. The indications were consequently to supplement the ovarian functioning by administration of ovarian extract. This counteracted the excess of

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pituitary hormones and the woman was cured in three months and an apparently normal pregnancy followed. Pregnancy acromegaly subsides spontaneously after delivery without fail as the ovaries resume their functioning, and he sought to follow Nature's method by supplying the lacking ovarian products. His success shows that acromegaly outside of pregnancy may be curable in this way. He knows of no other instance of the cure of acromegaly on record.

Zentralblatt für innere Medizin, Leipsic

July 12, XXXIV, No. 28, pp. 705-728

126 *Acute Exophthalmic Goiter. (Ueber akute Morbus Basedowii.) R. V. Funke.

126. **Acute Exophthalmic Goiter.**—Funke's four patients with acute exophthalmic goiter had only two constant symptoms, the tachycardia and the rapid and excessive loss of weight; in no other disease does the patient lose so rapidly in weight—in a case of Schlesinger's, 122 pounds in eleven weeks, and one of Funke's patients, 48 pounds in a few days, another 110 pounds in a few months. There was no enlargement of the thyroid in two cases and none in the beginning in another case in which later a large goiter developed. The tachycardia was constant and in some became a perpetual irregular arhythmia; the blood-pressure also ran up extremely high and in one of the cases has persisted high although there is nothing to indicate kidney disease. Fever of a remittent type was occasionally observed, especially in a case accompanied by motor disturbances resembling the severest type of chorea, persisting for some time after subsidence of the other symptoms. In addition to the clonic spasms in this case there was also contracture of the hands, suggesting tetany. The onset of trouble in one case simulated severe gastro-intestinal poisoning. All the cases improved in time to a condition which amounts to a clinical cure. Treatment was hygienic-dietetic with complete rest, kept up for a long time, supplemented later by mild hydrotherapy. He does not approve of operative measures in acute exophthalmic goiter but advocates it later, when the affection has subsided into a more chronic type and the patient is stronger. His patients were two girls of 16, a woman of 35 (whose mother had had exophthalmic goiter late in life and had recovered), and a robust man of 32 who had acquired extragenital syphilis. After an injection of salvarsan, nephritis developed with a severe infection of the left arm. The emotional stress of these occurrences was soon followed by development of tachycardia, enlargement of the thyroid and exophthalmos, while the weight dropped from 87 to 68 kg. Under treatment the tachycardia and struma subsided, but six months after the onset of the trouble, now, the pulse is still 80, but the patient feels quite well and attends regularly to business.

Gazzetta degli Ospedali e delle Cliniche, Milan

July 6, XXXIV, No. 80, pp. 823-838

127 Intoxication from Inhalation of Turpentine, etc., in Varnish. (Intossicazioni per i solventi delle vernici.) G. Porrini.

July 10, No. 82, pp. 847-854

128 The Proteolytic Ferment in the Feces in Connection with Disease of the Pancreas. (Nuovi casi di affezioni pancreatiche studiate in rapporto al potere proteolitico fecale.) A. Barlocco.

Policlinico, Rome

July 6, XX, No. 27, pp. 953-988

129 *Subcutaneous Injection of Phenol in Treatment of Tetanus. (La cura del tetano col metodo Baccelli.) V. Ascoli.

July, Surgical Section No. 7, pp. 289-336

130 *Bone Cysts. (Sulle cosidette cisti ossee.) G. Perez. Commenced in Vol. XIX.

131 The Toxins of the Streptothrix. F. Purpura.

132 Extraction of Bean in Infant's Trachea. (Voluminoso corpo estraneo nelle vie aeree; estrazione colla tracheotomia, guarigione.) A. Cantilena and G. Stretti.

133 Serodiagnosis of Echinococcus Disease. (Gli antigeni per la prova dello storno del complemento nell'echinococcosi.) G. Mazzantini.

129. **Subcutaneous Injection of Phenol in Treatment of Tetanus.**—Seven cases are reported in detail in which tetanus developing after an incubation of from four to six days was treated with subcutaneous injections of a 3 per cent. solution of phenol (carbolic acid) and the patients promptly recovered. (In one case alone the incubation had been fourteen or fifteen days.) Ascoli comments editorially on the efficacy of this method, introduced by Baccelli, and states that its very simplicity has cooperated in preventing its wider adoption; people put more faith in things that are more mysterious and harder to obtain than a simple 3 per cent. solution of phenol. Another reason why it is not more widely used is because those who have applied it have not dared to administer the proper doses but have restricted the dosage to 0.05 or 0.1 gm., while Baccelli insists on large doses, commencing with 0.2 or 0.3 gm. and increasing to 0.8 or 1 gm. per day. Any dosage less than this should not be called the Baccelli method. The seven cases here compiled are from the experience of six clinicians, including the Russian, Gulaew of Kazan.

130. **Osseous Cysts in the Bones.**—Perez' long article is based on a personal case and comparative analysis of the numerous cases on record of cystic degeneration of the bones, solitary bone cysts, fibrous ostitis, etc. He thinks that we must distinguish three clinical forms of the process, the generalized form described by Recklinghausen, the form of localized fibrous ostitis, and the form manifested by a simple pseudocyst. His case was of the latter type and he presents evidence to show that various causes may contribute to this affection; toxic, infectious, trophic or metabolic influences may be concerned in its production, but it is not known to develop except in the young, and the course is benign. The onset is so insidious that the affection may escape detection until the bone fractures. Roentgenoscopy shows a peculiarly light, sharply circumscribed patch and the slow growth excludes malignant disease. Another feature of the cysts or pseudocysts is that there may be periods of improvement or even retrogression. Echinococcus cysts generally prefer the flat and short bones and, if they locate in the long bones, it is generally in the upper part of the tibia and lower part of the femur, while the cysts are generally in the epiphysis of a long bone or near it. A process of tuberculous or other inflammatory nature is excluded by the lack of any reaction in the tissues around, and by the cylindrical or spindle-shaped enlargement of the whole of the bone. Fibrous ostitis generally affects adults and involves one or more segments of the shaft. Medicinal and general treatment is of little use except as adjuvants. Schroth has reported good effects in a case of Recklinghausen's disease from lime and Roentgen exposures of the ovaries. Excision of the diseased tissues is the radical and logical treatment, curetting the focus and removing all degenerated tissues around. The cavity left fills up with healthy granulations as a rule, with ultimate complete consolidation, even when merely a thin shell of bone was left. The mutilating operations are unjustified unless the cortex of the bone is degenerated beyond repair.

Riforma Medica, Naples

June 28, XXIX, No. 26, pp. 761-728

134 Yoghurt. (Ricerche sul latte acido coagulato—Yoghurt—consumato a Tripoli.) A. Livento.

July 5, No. 27, pp 729-756

135 *Vaccination against Tuberculosis. E. Maragliano. Commenced in No. 26.

136 Relation between the Toxic Action on the Blood and the Virulence of Streptococci. (Sul rapporto tra il potere emotossico e virulenza degli streptococchi.) R. De Martino.

135. **Vaccination against Tuberculosis.**—Maragliano appeals to practitioners, chiefs of hospitals, governments and friends of humanity everywhere to heed this report of his success in vaccinating against tuberculosis. He has been engaged in research in this line since 1895, as THE JOURNAL has mentioned from time to time. He has always insisted that immunization is the work of the toxins, not of the living bacilli, and consequently that vaccination should be done with killed bacilli and by the subcutaneous route. Others came around to these views later. He further insists that it is impossible to realize an absolute immunity by this or any means to date against tuberculosis or any infection; the

immunization can be only relative until this ideal is finally reached. His aim was to produce a vaccine which could be used to immunize those particularly exposed to tuberculosis, the vaccination to be by the same simple technic as for vaccination against small-pox. The results of his experimental work have been uniformly conclusive as to the efficacy of the vaccination. Rabbits and guinea-pigs vaccinated by the same technic as for man presented the same local reaction in the form of a pustule and general phenomena as in clinical cases; the leukocytes ran up from about 5,500 to 12,500; the polynuclear neutrophils in particular increased in numbers continuously for two weeks; the opsonic index, after a drop at first, increased from 0.80 to 2.11 in some of the animals, the agglutinating power increased from zero to 250; the precipitating power also increased, and antibodies appeared in the serum inducing deviation of complement in the biologic tests. Animals thus vaccinated were inoculated after two or three months with the minimal intravenous dose which kills control animals in ten or twelve weeks, and none of the vaccinated animals developed the disease. The same results were obtained in the clinic in regard to the opsonic index, agglutinins, precipitins, leukocytes, etc., but of course the supreme test of intentional inoculation with virulent bacilli cannot be applied to human beings. However, the persons he has vaccinated were selected for the purpose as being exceptionally exposed to tuberculosis, living with tuberculous members of the family or with an inherited tuberculous taint or caring for tuberculous individuals. As to the duration of the immunization, nothing is known as yet except that the stigmata of immunization, as he calls the change in the opsonic index, agglutinating and precipitating power, have persisted unimpaired in the individuals reexamined years later. He gives charts showing these findings in a few persons vaccinated from four to six years ago. He has been able to keep track of only 465 persons vaccinated between 1903 and 1910 in families that had been previously decimated with tuberculosis and not one of the vaccinated has since showed signs of any tuberculous affection. It has been impossible to keep the other hundreds under control. More instructive than the total figures are some family groups: In one group of ten families the parents are healthy but one or more of the children have pronounced tuberculosis. The other child or children were vaccinated from four to six years ago and all of the vaccinated are in good health to-day. In another group of eight families one of the parents was tuberculous and the two to five children were vaccinated, 1907-1909, and all are in good health to date; in one instance the father was tuberculous and had had five close relatives die of tuberculosis. In another group of eleven families from one to seven children had already died of tuberculosis when the surviving children were vaccinated, 1907-1909, and all of the vaccinated are in good health to date.

He cites others who have had similarly good results with the vaccination. The experiences to date are particularly instructive, he emphasizes, because the method has been applied only to the children of the poor, with no extraneous factors to aid in warding off tuberculosis. The environment was the same as before the vaccination.

He prepares the vaccine from cultures of virulent human bacilli, killed by heating to 80 C. for an hour on three successive days, which leaves the toxicity unimpaired. The dead bacilli are triturated in an agate mortar and mixed with two parts of glycerin, when the vaccine is ready to use. It can be made in any laboratory and applied by the Jenner technic, but he usually applies it with a grooved needle, puncturing the skin at three points in the deltoid region or in Scarpa's triangle in the thigh. Experience has shown that in this as in other infections a very small amount of the vaccine answers the desired purpose. He reaffirms in conclusion that all his and others' experience has confirmed the absolute harmlessness of the procedure with this technic, and he warns against the intravenous route. He also reiterates that the immunization protects only against a proportional dose of infection. The vaccinated animals contract tuberculosis, like the controls, when inoculated with massive doses.

Brazil-Medico, Rio de Janeiro

June 15, XXVII, No. 23, pp. 225-236

137 Biology of the Trypanosoma Cruzi. (Revisão do cyclo evolutivo do Trypanozoma Cruzi.) C. Chagas.

138 Serodiagnosis of Chagas' Trypanosomiasis. (Da reacção de Bordet e Gengou na molestia de Carlos Chagas como elemento diagnostico.) C. Guerreiro and A. Machado.

June 22, No. 24, pp. 237-248

139 *Negro's Sign in Peripheral Facial Paralysis. A. de Castro.

139. **Negro's Sign in Facial Paralysis.**—De Castro has found this sign constantly present in every case of peripheral facial paralysis. Negro called it the bulbo-palpebral hyperkinetic phenomenon, as it consists in the exaggerated position assumed by the eyeball when the patient is told to look up as high as he can. The eyeball on the side of the paralysis swings farther up than on the sound side, and in case both eyes are affected the phenomenon occurs on the side in which the paralysis is most severe.

Semana Medica, Buenos Aires

June 12, XX, No. 24, pp. 1357-1412

140 Diabetes. (A proposito de un caso de diabetes glicosurica.) J. R. Goyena.

141 Diathermia. (La calefaccion electrica. El termofilo electrico y sus aplicaciones higienicas y medicas.) V. Delfino.

142 Astigmatism. (Nota clinica sobre la correction subjetiva del astigmatismo.) R. Valero.

June 19, No. 25, pp. 1413-1476

143 Obstetric Version. (La maniobra de Wigand.) J. C. R. Dominguez.

144 Toxic Action of Aberrant Bile in Pulmonary Tuberculosis. (El papel intoxicante de la bilis en la tuberculosis pulmonar.) P. Serph, A. and A. Mary.

145 The Temperance Campaign in Argentina. (La campaña contra el alcoholismo en la Republica Argentina.) V. Delfino.

Hospitalstidende, Copenhagen

July 9, LVI, No. 28, pp. 769-796

146 Tertiary Syphilis with negative Wassermann Reaction. S and J. Nordentoft.

Hygiea, Stockholm

May, LXXV, No. 5, pp. 417-512

147 Variola in Stockholm; 36 Cases. (Iakttagelser ved smittkoppsepidemie i Stockholm 1913.) A. Leire.

148 Advantages of the Two-Route Treatment of Non-Tuberculous Infectious Processes. (Erfarenheter af sårbehandling med den Pfannenstilska metoden på icke tuberkulösa affektioner.) A. Reuterskiöld.

149 Topography of Cortex of Cerebellum. (Om lokalisation i lillhjärnshemisfärernas bark hos människan.) R. Barany.

150 Improved Technic for Access to the Hypophysis. (Om transnasala hypophysis-operationer.) G. Holmgren.

151 The Leukocytes and the Viscosity of the Blood. (Om de hvita blodkropparnas betydelse för blodviscositeten.) A. Gullbring.

Ugeskrift for Læger, Copenhagen

July 3, LXXV, No. 27, pp. 1149-1182

152 *By-Effects of Luminal. E. Blichert.

152. **By-Effects of Luminal.**—Blichert states that in five of the thirteen cases in which he administered this new hypnotic drug, signs of intoxication were evident; in two no effect was observed. In six the drug had the anticipated action without by-effects, but in one case after two weeks and in four earlier there were unmistakable signs of toxic action. In three in the latter group the luminal had no therapeutic influence at all. He cites communications in German literature in regard to a toxic action from luminal: Eder had two cases of a luminal eruption in 150 and Graeffner two in seventy-two cases. The exanthem in Blichert's cases was very pronounced; in one case after it had subsided it reappeared in full intensity after a week's interval without more of the drug having been taken in the interim. The eruption occurred in three of the four cases of pronounced toxic action. The dosage was 0.2 or 0.3 gm. three or two times a day, or 0.1 gm. in the morning and 0.2 gm. in the evening. In some of the cases veronal had been given at the same time or alternating with the luminal, but in two of the cases with most pronounced toxic action the luminal alone had been given.

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